

SUBTERRANEA BRITANNICA

SECRETARY'S NEWSLETTER NO 24

2002



The Control Room, WW II Southern Railway Communications Bunker, Deepdene, Dorking

Subterranea Britannica is a society devoted to the study of man-made and man-used, underground structures and the archaeology of the Cold War. The main focus of interest is on abandoned and forgotten structures and, in the case of Cold War structures, studies are entirely confined to declassified and decommissioned structures.

The society is open to all and its membership includes all walks of life. Members are invited to contribute to this newsletter even if this just means sending very welcome snippets from newspapers and magazines.

Newsletter Editors. Malcolm Tadd and Martin Snow

**Please send contributions to:
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Letter to the Editor

Street Subsidence in Rumania

Whilst in Bucharest, Rumania recently I was walking down a quite cobbled residential back street called Stouropoleas Street when I came across a section of road which had collapsed into a cellar about 8 feet deep and about 20 by 20 feet in area at the junction of this street and a side street that was blocked by the hole.

The slump appeared to be some months old judging by the softened and weather-eroded outline of the hole and weeds growing in the rubble that were a couple of feet tall. The barriers around the hole were very rudimentary affairs and I slid through them - the road being deserted early on Sunday morning everyone being in the adjacent Russian Orthodox Church.

The sides of the hole sloped very easily to the bottom, the area appearing to be a self-contained cellar or basement of vaulted red-brick construction with alcoves but no side

rooms or outlet passages, giving an impression that a building stood above it at some time past before the street layout was altered, the distance between the road surface and the cellar being about 12 inches a thin rubble and cobble crust which eventually failed.

The various service pipes one criss-crossed over the void some supported on brick columns some hanging free.

It seems hard to believe that the abandoned cellar was never backfilled before a road was put over it but judging from the old look of the subsidence and failure to have repaired it immediately, the apparent lack of funding for public works and the lackadaisical attitude and general inertia prevailing, I expect it will still be their unlit and unfilled for the unwary pedestrian or motorist in his Skoda or Trabant to fall into for some time to come.

Roger Cleaver

Newsletters of Subterranea Britannica are published by the committee of Subterranea Britannica. Original articles, book reviews, press cuttings, extracts from books and journals, letters to the editor etc. are welcome. However the editor reserves the right not to publish material without giving a reason.

The committee of Subterranea Britannica and the editor do not necessarily agree with any views expressed and cannot check the accuracy of any material sent in.

FORTHCOMING EVENTS

Visit to Royal Naval Propellant Factory
at Caerwent in Monmouthshire on 16th March 2002
led by Nick Catford & Medwin Parry.

For a detailed history of the site see
<http://www.btinternet.com/~burtonvilla/caerwentcom/npf01.htm>
This is an active army training area with over 1500
standing buildings. For further details and bookings
contact Nick Catford on 01322 408081

Spring Day Conference Royal School of Mines
6th April 2002

Hack Green Cold War Study Day
13th April 2002.
See end of newsletter for application form.

French Weekend 2002
Provisionally 11-12 May 2002.
See end of newsletter for application form

Study Weekend 2002
Provisionally 20th July 2002 at Dudley

Autumn Day Conference Cambridge.
Provisionally 19th October 2002

NAMHO 2002
At Aberystwyth on 5-8 July 2002
A Conference to consider: 'The application of water to mining'.
Conference Secretary is John Hine, The Grottage, 2
Cullis Lane, Mile End, Coleford, Glos. GL16 7QF
See also www.namho.org

VISIT INFORMATION

Some members don't yet have an e-mail address and consequently feel disadvantaged in obtaining information about forthcoming site visits. These trips and visits, which are in addition to the published Subterranea Britannica field trips and study weekends, are arranged by individual members through their own personal contacts and resources. They are often arranged at very short notice and usually have restrictions on numbers. This precludes advance notice being given in our normal correspondence or published information - including this Newsletter.

If you have a computer and wish to be included it is very simple to arrange, once you are on-line, all you need to do is contact our Webmaster and you will then receive all the e-mail correspondence.

On the other hand if you are a total technophobe and cannot possibly contemplate using a PC, there is now an alternative. If you wish to keep abreast of what is happening, you can register with Committee Member John Burgess who has volunteered to take calls from members and advise them of forthcoming events.

He can be contacted on his mobile telephone number, 077 70 31 55 33

JIM BRADSHAW – 1919 to 2001

James Bradshaw, always Jim to his many friends, was born in Manchester on 1st December 1919, the eldest of six children. He left secondary school at 14 without formal qualifications as his family could not afford to send him to grammar school, although he had passed the entrance examination. He had a number of jobs before joining the Army in 1939. During World War II he saw action in North Africa, Sicily, mainland Italy, and Europe.

After the war, from 1947 onwards, he worked for the Forestry Commission, at first in the Lake District and from 1958 in Kent, where he moved with his wife Marian and three children. He retired in the mid 1970s as a result of eye problems and soon after the death of his wife, became very interested and actively involved in archaeology

Jim has more entries credited to him in the Kent Sites and Monuments Record than any other single person. In particular, he was an active member of the Kent Underground Research Group, and of Subterranea Britannica, specialising in chalk wells and deneholes. Other

interests included the military structures, medals, and war memorial of the two World Wars.

Jim's last appearance at a Subterranea Britannica event was on the visit to Arras and area in the Spring of 2001. In previous years he has often formed a part of the British contingent at international conferences in, especially, Belgium, France, and the Netherlands. Subterranea Britannica members will always remember him for his humour, humanity, and common sense. He was still actively recording Kentish war memorials for the Ministry of Defence shortly before his death in hospital on 20 July 2001, following several heart attacks.

Subterranea Britannica, the Kent Underground Research group, the Kent Archaeological Society, and the Canterbury Archaeological Trust were all represented at Jim's humanist funeral service at the crematorium at Charing on 31st July. He leaves two daughters, a son, several grand-children and great-grandchildren, a famous 200 cc motorbike, and many friends around the world.

Paul W. Sowan from notes provided by Sue Bradshaw

World War Two and Regional Seat of Government Bunker

From Sussex industrial Archaeological Society Newsletter 111

During WWII Canadian Engineers spent six weeks digging a huge bunker at Kings Standing (TQ 476292) Ashdown Forest, Sussex. It housed a very powerful wireless transmitter and broadcast subversive propaganda to confuse the Germans. It was nicknamed 'Aspidistra'. (A contemporary pop singer named Gracie Fields had a song 'The biggest Aspidistra in the World. As the medium wave transmitter, acquired from USA, was then the biggest in the world ...)

In the 1980s it was refitted as a Regional Seat of Government (one of seventeen) but is now in the hands of Sussex Police who seem to allow visits on occasions. The Article gives a short description of the site.

Air Raid Shelter at No.9 Roedean Crescent, Brighton.

From Sussex industrial Archaeological Society Newsletter 111

Work on this house revealed a forgotten 10 feet square air raid shelter beneath. It had a wood block floor, plastered walls and electric lighting and an escape hatch. It also contained an air purification plant dating to 1940, described as an 'ARP Plant' and manufactured by Keith Blackman Ltd., Engineers of London.

This site is also discussed in *Council for British Archaeology South Eastern Newsletter 20, page 11, Autumn 2001*. Here it is speculated it might not have been an air raid shelter but some feature associated with Roedean School which was taken over by the enemy during WWII. Or it could have been a listening post or a Secret Resistance Army hideout ...

Roscobie Quarry and Blue Limestone Mine.

From, The Grampian Speleological Group Bulletin, Vol 4, No. 4, October 2000.

Roscobie Quarry (NT 091932) and its associated mine workings are south-west of Roscobie reservoir in Fife. Members of The Grampian Speleological Society practice cave diving at this site because all but one of the nine entrances to the abandoned mine workings are in the flooded open quarry 's cliff face and below water level. The article describes some of the flooded passages.

Most of the mines are believed to have been worked in the 1940s and 50s but the only entrance above water level leads to earlier workings and a survey gives a date of 1925.

The site is a SSSI because of its fossil biogenic reefs.

Chalkwell subsidence at, Spade Lane, Hartlip, Kent (TQ 8356 6504)

From Kent Underground Research Group Newsletter Newsletter 68, March 2001

On 26th November 2000, a collapse revealed a chalkwell with three small chambers radiating from its base. Investigators descended 11.6 metres. A suggested date for it is late 18th or early 19th century and it has now been filled. A denehole dating to 12th-15th Century was found in the vicinity in 1961

Dene Hole, Northall Road, Barnhurst, Kent. NGR TQ 504765

From, Kent Underground Research Group, Newsletter No. 69, June 2001

The newsletter talks of a survey but gives no details. A hole had suddenly appeared in the front garden of a house and it was found that a dene hole chamber had collapsed. There is a history of dene hole problems at this house and it was underpinned 50 years ago. There is also a filled shaft next door.

The hole examined has now been filled with gravel and cement grout.

Chalk Well at Greenwich University NGR TQ 531727

From, Kent Underground Research Group, Newsletter No. 69, June 2001

A hole appeared near a residential block. It was 18 metres deep and there were three chambers each 6 metres long at the bottom. The hole had been the result of a steel and concrete cap falling down the shaft.

Chalk Mine Under Car Park at Tudor Court Primary School, Chafford Hundreds, Essex

From, Kent Underground Research Group, Newsletter No. 69, June 2001

The school car park has become distorted with undulations believed to be the result of man-made underground workings collapsing. At one place a rectangular chalk cavity 1 metre below ground was revealed. It was 3 metres wide, 2.5 metres high and about 7 metres long. It is assumed to be part of more extensive lost workings.

Chalkwell at, Hole Street Farm, Lynsted, Kent.

From, Kent Underground Research Group, Newsletter No. 69, June 2001

A collapse revealed a chalk well type of dene hole. It was 15.6 metres deep and 2.0 metres wide. And had passed through 1.9 metres of clay-with-flints before entering the upper chalk. Three chambers emanated from the bottom each 8.0 metres long, 5.1 metres wide, and 4.2 metres high. It is believed to have supplied raw chalk as a top dressing on fields in the 18th century.

The shaft is now protected with a bat grill.

Domestic Wells

From, Kent Underground Research Group, Newsletter No. 68, March 2001

At Swanswood Farm Harvel Road, Harvel, Kent a well 95.5m deep into chalk was inspected

From, Kent Underground Research Group, Newsletter No. 68, March 2001

At Well House, The Street, Meopham, Kent a well 60.75m deep into chalk was inspected. The Swanswood and the Meopham wells had similar winding gear.

From, Kent Underground Research Group, Newsletter No. 70, September 2001

At The Heath House, Heath Road, Loose, Near Maidstone, Kent a well 1.25m in diameter, 32.5 metres deep, with 2.6m depth of water was explored. The well was lined to 9.6 meters with ragstone blocks but after this the lining continued on one side only. The strata at the lower levels was Kentish Ragstone.

Sand Mine in Garden of 18 Old Park Road, Abbey Wood, Kent.

From, Kent Underground Research Group, Newsletter No. 70, September 2001

Remains of an adit were found.

Detection of Service Tunnels in London

From, Kent Underground Research Group, Newsletter No. 70, September 2001

The routes of Service tunnels constructed as the result of the London County Council (Subways) Act 1893 can be traced by large grills with metal trapdoors set in pavements or islands in the middle of the road.

The newsletter item gives GPS readings for grills in the Kingsway area.

Kelly Mine Preservation Society

This society was formed in 1984 to save and restore the remains of Kelly mine. The site can be visited by writing to Graeme Spink, KMPS. 10 Cardinal Avenue, St. Budeaux, Plymouth, Devon. PL5 1UW. It is at Lustleigh within the Dartmoor National Park.

Kelly Mine was a haematite mine. That is to say it yielded an oxide of iron called micaceous haematite or 'Shiny Ore' which dried to a grey powder. It seems to have opened in the 18th century with the dried powder being sold as 'pounce'. Pounce was any substance used to dry ink on documents. Because it absorbed water very well micaceous haematite made the best pounce. Alternatives were fine sand, as in Reigate Silver Sand, or powdered cuttlefish bone.

A later and more important use was in as a corrosion resistant paint. The ore consists of overlapping flakes. Thus for example it was used in Navy Grey paint for warships. The substance is still use for this purpose but it has to be manufactured because there are very few natural deposits left.

Kelly Mine closed in 1951.

This information is from Kent Underground Research Group, Newsletter No. 69, June 2001 and a full article in, *Industrial Heritage, Vol.27 No.1 Spring 2001*

Bid to designate Cornwall's mining areas as a world heritage site.

World heritage sites are places like the Taj Mahal, Stonehenge and the Great Wall of China.

An enthusiastic team of archaeologists and historians is collecting evidence to persuade the United Nations Education Social and Cultural Organisation (UNESCO) of the international significance of Cornish mining sites and landscapes. A detailed database is being prepared for a web site. Something for Sub. Brit to think about!

The Cornish Mining World Heritage Site Bid, Cornwall Archaeological Unit, Percuil Building, Old County Hall, Truro TR1 3AY. Contact Adam Sharpe, Project Manager. 01872 322585 Email asharpe@cornwall.gov.uk

More to see at Dover Castle

On 12th February 2001 English Heritage unveiled 'The secret Coastal Artillery Operations Room under Dover Castle'. This has been restored to its condition in 1942 – 1945 when Admiral Sir Bertram Ramsey masterminded the naval defence of the Kent Coastline during WWII

Williamson's Tunnels Liverpool

Efforts to restore Liverpool's famed brick-lined Williamson's Tunnels are in the hands of two voluntary societies, Friends of Williamson's Tunnels (FoWT) and the Joseph Williamson Society (JWS). JWS was founded in 1996 when two tunnels under the Smithdown Lane/Grinfield site were threatened by a new student housing development at a site where the Lord Mayors stable yard formerly stood. FoWT is concerned not only with these tunnels but other of Williamson's tunnels and is the larger of the societies boasting of over 1000 members. JWS have secured considerable funding: £277,000 from Europe £60,000 from the local regeneration fund, a community loan of £65,000, a council loan of £135,000 + a further £128,000. In addition to clearing out the caves visitor centre would have to be provided for this money.

FoWT are principally concerned with a site at Mason Street and at Paddington. At the moment they are concentrating on the Paddington Site where huge amounts of infill have to be removed to restore two H-shaped voids one above the other.

Not unsurprisingly Liverpool Council is beginning to insist that the two societies cooperate which has certainly not hitherto been the case.

Apart from Williamson's Tunnels other tunnels are coming to light as research progresses which may predate Williamson.

This information is taken from FoWT's bulletin (beautifully produced): The Mole, Issue 11 July 2001.

www.williamsonstunnels.com

International Event –Souterrains 2K2

FoWT are to host this event for underground enthusiasts sometime in 2002. It will organise trips to underground sites in the Liverpool area.

Reigate. Preservation of Tunnel Road Caves.

Reigate has a famous brick-lined road tunnel which was opened in 1824 and is now a walkway The Wealden Cave and Mine Society (WCMS) have obtained a licence from the council to develop sand caverns on the east side of the tunnel as a visitor attraction while at the same time preserving the caverns. They have now created a visitor route through and also created private facilities for the guides such as toilets. WCMS will look incredulously, perhaps enviously, at the money donated to the Joseph Williamson Society as discussed above. WCMS collects pennies from visitors – but it is wonderful what can be done on a shoestring with enthusiastic volunteers.

Preservation of Derbyshire Lead Mines and Scheduled Monument Status

In the Newsletter of Peak District Mines Historical Society 97, 5-6, Jan 2001 is an article by J.H. Rieuwerts discussing efforts over about 40 years to schedule Derbyshire's lead mining sites. 36 sites excluding smelting sites are now scheduled.

Secret Tunnel at Worthing

A recent cutting from the local Evening Argus at Worthing tells of a tunnel bored into the chalk at Mill Lane during the invasion scare or 1940. It was equipped with a strong safe door and used to house art treasures etc. The bulk of this article describes how the Town Clark hid the town's records in the mausoleum at Broadwater cemetery.

Grottoes

All grotto enthusiasts will be familiar with Barbara Jones, *Follies and Grottoes*. They may therefore be interested to know that her biography has been published. This is well reviewed in: *Follies, Vol. 12, No. 4, Spring 2001*.

The Life and Work of Barbara Jones (1912-1978). Barry Bloomfield, (Quarterly Journal of the Private Libraries Association, Fifth Series, Vol.2:3. Autumn 1999). The Private Library 2000. 48pp, £5.00. ISSN 0032-8898

The Calamity at Field Road Reading. And Norwich, and Edinburgh ...

From Chelsea Speleological Society Newsletter, Vol 43. No.7, July 2001

Collapses of property into chalk caverns at the Field Road area in Reading were sufficiently alarming to be reported nationally. It was reported that 180 residents were evacuated. From the historic point of view there are reports of brickworks in the area back to 1817. It is also recorded that Reading clay used to make bricks was less 'fat' than was desirable. The clay was therefore improved by the incorporation of chalk up to, it is believed, a maximum of 25%. After this the bricks do not withstand the weather. The association of chalk mines and brickworks has also been noted in Kent.

The Field Road houses appear to have been built on both debris from mining and quarrying and also underground chalk passages. The collapses of January –October 2000 resulted from unprecedented heavy rains of that time and the problem was compounded when an initial slippage fractured the water main.

Even in the nineteen fifties and sixties subsidence occurred and houses were demolished. A block of flats was built after bore holes were sunk. Loose material was detected but it was not recognised as filling in chalk mines. Another mistake was although the piles were sunk to solid chalk it was not appreciated that there could be, and were, mines deeper down.

The article in the CSS newsletter was based on a talk given by Clive Edmunds and John Talbot of Peter Brett Associates, Consulting Engineers. The underground galleries were examined by lowering CCTV cameras down boreholes. Galleries were found to be 3-5 metres high. Once the ceilings gave way spaces had migrated to the surface thus damaging property. Four of interconnected mine workings and isolated galleries have been located.

£2.6 million has been so far allocated by the government for remedial work and another £2 million has been asked for. The method of stabilisation is to seal off the periphery of an area and fill the interior with recycled concrete. Cement is then forced in under pressure until no more will go. This is called 'compaction grouting'. By dividing all the unstable ground into these areas and repeating the process total stabilisation can be achieved.

Apart from CCTV examination, mechanical probing, resistivity and microgravity surveying has been adopted. Also light cable percussion boreholing has been used. If you hammer a rod into the ground it will go easier if you encounter a cavity. This technique is a refinement of this principle

There is a case for believing that the authorities were a little late in recognising that instability in the Field road area needed attention.

Thus in Chelsea Speleological Society Newsletter, Vol 42. No.4 April 2001 we read of a list of collapses over a long period.

1931 a garden shed was followed up.

1951 craters appeared in various gardens. Residents spoke of three cracked and subsiding houses. A 70 year resident recalled collapses in the past.

1996 a hole appeared in Palmer Park Sports stadium
1998 a hole appeared at Henwick Recreation ground while football was in progress.

The New Civil Engineer 10/5/2001 discusses subsidence caused by abandoned mines resulting in structural stability not only in Reading but in Norwich and Edinburgh, and mentions Taplow in Berkshire and Swanley in Kent.

Chalk mining in Norwich possibly dates back to the 11th century and like Reading, threats to the structural stability of a tower block was caused by a fractured water main. Last year residents noticed a drop in water pressure and this was accompanied by sagging pavements. Inspection revealed a cavity 9m deep and 8m wide beneath one quarter of the building. The building was therefore evacuated. Research showed the building was founded on 170 20m Franki piles.

But the tower block has now been rescued. The method was to form a grout wall around the void and then filling the space between the piles with cement and bentonite mix at low pressure. The grout wall was formed with sand, bentonite, cement and pulverised fuel ash mix.

At Reading similar grouting methods will be used but the situation is much more complicated.

As regards the grouting mixes, not mentioned in the article, is that bentonite is a clay which swells when wet and forms a water impervious barrier. Because it has unpleasant contaminants pulverised fuel ash has been regarded with suspicion. It was proposed as a fill at Combe Down Bath (see later in the newsletter) but this attracted outraged protests.

Residents of in the Ferniehill district in Edinburgh were totally out of luck. A hole appeared in the ground and houses began to crack forcing immediate evacuation. Then three nearby blocks of flats were discovered to be unsafe and the situation got worse. It was discovered the buildings at the nearby Morton Park View were under threat. The whole lot had been constructed, apparently knowingly, over limestone mines 15 – 30m below ground level. These mines were closed in the 1940s and were important for a band of pure (98%) calcium carbonate band below the limestone. But pumping at a nearby coal works ceased and the accumulating groundwater reached and washed out the calcium carbonate at the base of the pillars which support the galleries of the limestone mines.

Sadly the ground at Edinburgh cannot be stabilised. So far 30 houses have been demolished and there is more to come. The Scottish executive is to set up an enquiry to determine why building took place over old mine workings in the first place.

And Britain is not the only country threatened by mining subsidence – there's Belgium

An article, *Geohazards – last legacy of war?*, Peter Doyle, Peter Barton and Mike Rosenbaum, *Geoscientist*, 11(i) 4-7, Jan 2001 describes subsidence in the Belgium town of Nieuwpoort which has long been of strategic military importance. It is the hub of a system of five waterways controlling Flanders and was developed as a fortress by Vauban during the reign of Louis XIV and so it is possible that there are forgotten tunnels associated with the fortifications under the present town. However the town came under severe and prolonged attack in WWI resulting in a French army mutiny in 1917. Thus for a period the

town was defended by the British. Many kilometres of defensive tunnels were then dug under the streets of the town linking to cellars of ruined houses. It is not known what has happened to these tunnels over the course of time as the town expanded although military archives reveal an incomplete series of maps.

Recent very serious structural failure of houses has caused a preliminary investigation into these tunnels to be instigated with the view to a more detailed study to be performed at Greenwich and Nottingham Trent universities.

The Balcombe Tunnel, Sussex

Extracted from, *The Building of Balcombe Tunnel*, Pat Milward, *Sussex Industrial History*, No. 30, 2000, pp 19. Includes a good bibliography and 82 references.

If you asked a very young child to devise a railway route to connect London to Brighton immediately to its south, the child would probably draw a straight line. But this would be simplistic, totally ignoring the topology of the land and requiring a series of tunnels, bridges and cuttings to overcome the various hills and valleys. Nevertheless this is what John Rennie proposed to a Parliamentary Committee in 1836 – early on in the history of railway building. There were six proposals for the route but the enquiry which lasted from 16 March to 8th August came down to a contest between Robert Stephenson, a proponent of a more roundabout route, and Rennie. Rennie who had just returned from abroad represented his plans in a confused manner and his other difficulty was that he had never designed a steam railway before – only temporary horse drawn tramways. Despite this he had popular opinion, especially in Brighton, on his side and was supported by some experienced steam railway engineers notably Rastrick.

Balcombe lies about half way between London and Brighton in the High Weald which is a line of hills. Tunnelling was the only way through and it was this tunnel which was the chief bone of contention. Apart from engineering considerations tunnels were said to be unpopular with the public – they were frightened of them and some medical opinion was alarmist. Smoke filled tunnels would be very bad for health.

But it was the engineering considerations that were fiercely debated. The land for the tunnel was composed of faulted and eroded layers of clays and sands creating a rugged landscape of streams and ravines which would be difficult to drain. Yet, Rennie saw no problem. Mere rills to the north of the tunnel could be culverted and to the south the River Ouse Valley was to be crossed by embankments and a high viaduct. He also believed the tunnel would need no shafts.

In the end the Committee reached no decision and it was adjourned until 1837 when Captain Robert Alderson RE adjudged that Rennie's line including the Balcombe should be constructed despite Stephenson's being the favourite on purely engineering considerations. And so it was that tunnel digging started in 1838. It was dug by sinking five shafts to the required depth and connecting the shaft bottoms and was lined with five rings of brick 22.5 inches thick except in the invert (inverted slightly arched brick floor) which was 18 inches thick. The tunnel was elliptical in shape.

But Rennie had underestimated the constructional problems. The water was a severe problem and has remained so until this day. The tunnel cost three times the original estimate and the line as a whole cost so much that a committee was set up to examine the accounts and the Company Secretary absconded with some of the funds. Naturally in appeasing the enraged shareholders the directors blamed the engineers. And so the complete story of the Balcombe Tunnel is one of clever advanced engineering coupled with mismanagement, greed and dishonesty. The present owner of the tunnel is Railtrack which is a story of ...

Labyrinths and Mazes

The Cretan Maze symbol is drawn on the walls of some underground places and the association has been discussed in a previous newsletter. Actually this particular symbol represents a labyrinth because there is only one way through and no way of getting lost. Trying to find information on the Cretan labyrinth has been a minor quest of your Editor Malcolm Tadd for some time. He therefore notes with

interest a glowing book review in *Follies*, Vol. 13, No1 Summer 2001 for, *Through the Labyrinth*, Herman Kern, Prestel, Munich and London 2000. 360pp £50.00 ISBN 3 79132 144 7

If you are interested in the subject this book makes obvious reading. So I will order a copy from the public library (£50 is out of my price range) and report back in a later newsletter.

Caves, Cairns, Tunnels, Passages, and Pits in Scotland

This is a précis of part 1 of a long two-part article by *John Crae* in *The Grampian Speleological Group Bulletin*, Vol. 5, No. 5, March 2001. It is a list of underground monuments protected by Historic Scotland and gives details. The next newsletter will give a précis of part 2.

Ardeer Recreational Club Cave. NS 271419.

Subterranean passage and cave belonging to ICI.

Bagh na h-Uamha Cave, Rum

Contains sea cave and evidence of ancient occupation.

Caiplie Caves (NO 599058)

Sandstone caves with early Christian and medieval carvings and Pictish markings

Constantine's Cave, Fife, Ness (NO 632101)

Dunagoil (NS 083531 – NS 087533)

Caves in cliff below a medieval settlement.

Creag nan Uamh (NC 268170)

Eight caves, four in a limestone cliff. Associated with the Vikings.

Keil Cave (NR 671077)

Sea cave associated with a medieval chapel

Hawthornden Castle and Caves (NT 286636)

Subterranean prison etc. and associations with the Knights Templar.

Kings Cave, Torbeg, Blackwaterfoot (NR 884309)

A Sea Cave

Caves, South of King's Cave, Isle of Arran (NR 884309)

Associated with the Norse.

Loch Gille-ghoid (NF 957714)

Cave settlement associated with the Norse.

Rashoille (NM 819001)

Natural Cave.

Sculptor's Cave, Covesea (NJ 175707)

Sea Cave owned by Gordonstoune Schools Ltd.

Smoo Cave (NC 418671)

Sea Cave associated with pre-historic occupation.

St. Ceiran's Cave (NR 765170)

Sea Cave on east coast of Mull of Kintyre

St. Cormack's Cave, Eilean Mor (NR 666753)

Hermit's Cave, parts of early crosses, chapel etc.

St. Ninian's Cave (NX 421359)

Sea Cave associated with St. Ninian

Wemyss Caves (NT 347973 – NT 342969)

Eight caves in cliffs above raised beach. Interesting wall carvings

Ardestie and Carlungie Earth-Houses (NO 502344, NO 511359))

Iron age souterrains

Cave of Oars (NG 549363)

Souterrain on Isle of Raasay.

Culsh Earth-House

Souterrain to east of Aberdeen about 2000 years old.

St. Medan's Chapel and Cave (NX 143316)

Souterrain.

Crichton Earth-House (NT 400619)

Souterrain probably dating to 2nd century AD

Grain Earth-House, Kirkwall, Orkney (NY 442117)

Grain souterrain

Pitcur Earth-House (NO 253374)

Souterrain

Rennibister Earth-House, Kirkwall, Orkney (NY 397127)

Once used as a burial chamber.

Skara Brae, Orkney (HY 231188)

Earth houses at the earliest known farming village in Britain and the most complex of all the settlements discovered on Orkney

Crossraguel Abbey, Ayrshire. (NS 275083)

Abbey abandoned in 1560 but sewer passages remain.

Dundrennan Abbey (NX 747474 – NX 751476)

Traces of sewer passages remaining

Glenluce Abbey (NX 185586)

Sewer tunnels

Melrose Abbey (NT 584341)

Sewer tunnel

Paisley Abbey (NS 485645)

Very interesting sewer tunnels running between site of Abbey and River Cart.

Underground Sites in North West of England

Paul Sowan has extracted information from: *List of Scheduled Monuments: North West Region*. Published by English Heritage, 2000

The following underground monuments are included.

Edgar's Cave (SJ 40676560) Chester, Cheshire. Roman quarry including Edgar's Cave. 150 m south west of Dee Bridge.

Cave. (SD 39107565) Lower Allithwaite, Cumbria. Kirkhead Cave

Caves (NY 467534). Wetheral, Cumbria. St. Constantine's cells (Wetheral Caves) and rock-cut Roman inscription.

Cave SD (483730) Warton, Lancashire. Dog Holes Cave.

Cave SD (48187285) Warton, Lancashire. Badger Hole, Warton Crag.

Icehouse (SJ 84045949) Congleton, Cheshire. Moreton cum Alcumlow. At Great Moreton Hall, 70m east of the hall SJ 84045949

Icehouse (SJ 31407405) Ellesmere Port and Neston, Cheshire. 110m south west of Burton Manor College main building. SJ 31407405

Macclesfield, Cheshire

Icehouse (SJ 92948428) Poynton-with-Worth. At the site of Poynton Hall. 170m north of Towers Yard Farm

Colliery (NX 96721759) Whitehaven, Cumbria. Haig Colliery.

Lead mines (NY 78304349, NY 78404332) Alston Moor, Cumbria. Lead mines, ore works and smeltnill at. Nenthead.

Lead workings. (NY 74374333) Alston Moor. Cumbria Fletcheras Rake lead workings.

Lead mines (NY 75264254) Alston Moor. Cumbria Whitesike and Bentyfield lead mines and ore works.

Lead workings (NY 75904207, NY 76504226, NY 77074224) Alston Moor. Cumbria Lead rake workings on Flinty Fell, 800m north west of Flinty Quarry.

Lead and fluorspar mines (NY 69694215, NY 70134280) Alston Moor, Cumbria Rotherhopefell lead and fluorspar mines and ore works.

Lead mines (NY 75224628) Alston Moor, Cumbria. Hudgill lead mine bingsteads,. 200m north east of Hudgill Farm.

Lead mine (NY 70753531) Alston Moor. Cumbria Upper Slatesike lead mine and ore works, 750m north east of Black Dub.

Lead mining (NY 71113581) Culgaith. Cumbria, Cashwell hush and lead mining remains.

Lead mines (NY 75892245) Murton. Cumbria Scordale lead mines.

Lead mines (NY 35931783) Patterdale. Cumbria Greenside lead mines, ore works and smelt mill.

Potash pit (SD 41259220) Cartmel Fell Cumbria. Winstor potash pit.

Copper mines (SD 285987) Coniston, Cumbria Coniston copper mines.

Tunnel (SD 509850 – SD 513852) Hincaster, Cumbria. Hincaster Tunnel horse path.

Lead mine (NY 34970863) Grasmere, Cumbria. Lead mine and ore works at Greenhead Gill, Grasmere

Potash pit (NY 473001) Over Staveley, Cumbria. Elftiow potash pit.

Canal tunnel. (SD 745005 - SD 745005) Salford, Greater Manchester. Canal tunnel entrances and wharf.

Mine Drainage Sough (SD 59100714) Wigan, Greater Manchester. Haigh Sough mine drainage portal. 310m west of Park House.

Ice-house (SD 852309) Burnley, Lancashire. Ice-house at Towneley Hall.

Colliery (SD 62916975) Tatham, Lancashire. Clintsfiel Colliery.

Lead mine (SD 69294809) Newton, Lancashire. Ashnott lead mine and lime kiln, 90m south of Ashnott.

Ice-house (SJ 68428703) Merseyside, Warrington. Lymm. Lymm Hall moated site and ice-house.

WINTER 2000/2001**RAINFALL AND FLOODING IN EAST SURREY MINES AND QUARRIES**

Notes compiled by Paul Sowan 25th February 2001

There was exceptionally heavy and prolonged rainfall in the period, with the unsurprising consequences (amongst others) that the Caterham and Coulsdon Bournes have excelled themselves this year, and there have been noteworthy high water levels in east Surrey's mines and quarries. Some notes on water in the underground workings follow.

Westhumble (Mickleham) - underground chalk quarry (for building stone) (TQ 154521) - this exceptionally poorly documented and researched working appears to be a pre-19th C. underground quarry for hard chalk for building (chalk as a building-stone is known nearby, for example at Betchworth Castle and in some local churches.) There have been so many roof-falls that there are very few places where original quarry floor or ceiling can be seen - but the very shattered nature of the rock makes it ideal for hibernating bats, and the quarry has been a gated bat reserve since the 1970s. An annual bat count, this year, had to be postponed as the entire quarry (or 'mine' in current legal terms) has been flooded, with water pouring out of the entrance. There has been from two to four metres vertical depth of water in the underground workings, the water evidently entering via a steeply dipping fault plane. The quarry is mentioned in various 19th C. published sources, but this is the first time any underground floodwater has been noted.

Brockbam hearthstone mine (TQ 198510) - the shaft to this mine was dug out by members of the Wealden Cave and Mine Society and the Kent Underground Research Group in the 1990s, the depth to mine gallery being ascertained as about 18 metres. Before it was backfilled, the last known record for this shaft noted floodwater 'at the bottom' in the 1930s (the mine closed in 1925.) Reports this last winter are of water standing in the shaft again.

Merstham Quarry Field quarry (TQ 29545390) - this quarry access shaft is a modern construction associated with the making of the M23 motorway, and gives access to early 19th C. quarry workings associated with the southern terminus of the Croydon, Merstham, and Godstone Iron Railway of c. 1805 - 38, and with the early civil engineering contractors Jolliffe & Banks. Early difficulties with groundwater led to the construction, from 1807 to 1809, of a drainage sough, which allowed quarrying down-dip below the pre-existing water table. This soon collapsed and / or was blocked, and lower levels of underground quarry galleries have been flooded to the quarry ceilings for much of the last two centuries. The floodwater level is always visible from the bottom of the access shaft, and has been seen to vary by about a metre during recent years. During a visit on 10th February 2001 the flood water level was observed to be much higher than ever noted before, reaching over halfway up the rectangular access opening at the bottom of the steel-lined shaft. The only way to visit this quarry without getting wet was via the motorway drainage system (which, interestingly, has never yet diverted water into the quarry.)

Merstham / Chaldon quarries (TQ 3053 and 3153) - these quarries usually contain no standing floodwater. However, it is reported that during the current winter there has been some flooding which has made access to some areas possible only by the use of cave diving techniques.

Godstone Hill quarries (TQ 3553) - these quarry tunnels run in about 300 metres down-dip from the several entrances, and as early as the 1860s periodic flooding was recorded, sometimes as much as a third to two thirds of the quarry being flooded. Flood water levels underground were marked on the walls from 1843 to 1876, and it was demonstrated by Baldwin Latham (engineer for the Croydon Local Board of Health) that there was no simple relationship between Godstone quarry flood water levels and Caterham Bourne flows. During the current winter, floodwaters have been observed higher than in the previous 30 years (some way above the western end of the 'northern cross passage' when visited on February.) The spring in the main Godstone Hill access tunnel, by the iron plateway junctions, usually has a very small trickle of water running, but is currently running strongly. And additional springs, on joints in the rock, are now also running strongly. Presumably the quarry never fills up completely, and the water eventually escapes, as a result of joints providing a means of escape northwards into the Chalk aquifer.

Carthorse quarry (Godstone) (TQ 35205370) - has occasionally been found to have up to 0.4m of water in the lowest north-western corner of the workings, but this winter (on 11th February) it was found to be two to three times as deep. Usually, so far as is known, the entire quarry is dry throughout the year.

Marden quarry / mine (Godstone) (TQ 35705347) - there was no flooding on 11th February 2001.

Barons' Cave Reigate The editor wishes to point out that a few inches of flooding occurred in the spacious bottom chamber this ancient monument. As this cave is dug in the porous sandstone of the castle mound and is well above any known water table this is a mystery. Your editor likes to think that this the first time this chamber has flooded in its many centuries of existence.

Godstone, Surrey Wartime Use of Carthorse, Hearthstone Mine

In a recent Chelsea Speleological Society Newsletter Harry Pearman lists files found in the British Museum of Natural History which relate to their use of Carthorse Mine during WWII to store 21,315 samples. The files are, DF203/9, DF203/10, DF203/16, DF203/17

Visit to Brighton sewers

by Nick Catford

On Saturday 9th June 2001 20 members of Subterranea Britannica headed down to Brighton for a gentle stroll round the town sewers. During the summer months, Southern Water, who own the network of Victorian sewers running under the town, take visitors a short distance into the Brighton underworld. The entrance to the sewers is through pier arch 260 beneath the Palace Pier. As soon as the door opened the smell of raw sewage hit us and stayed with us through out the trip. "Your nose soon get anaesthetised to it" our guide told us; my nose certainly didn't.

Having donned hard hats a tally and gloves to protect our hands from rats which have been known to scurry along the hand rails, we were also warned about open cuts coming into contact with rats urine which can lead to Weil's disease. We didn't see any rats although I noticed a couple of trays of rat poison lying on the ground. We moved forward into a small room where we saw a video about the sewers and the recently constructed storm water storage tank running 100 feet deep along the beach. Our guide also explained that the tours started later than usual this year. Normally the underground summer trips would begin again at the Brighton Festival in May when they are always a sell-out attraction. However, visitor facilities, lighting and other safety devices installed in the sewers specifically to allow the public to visit were badly damaged in the winter storms. He explained "At times the sewers were dealing with huge volumes of water which has damaged lighting and alarm systems installed to enable the public to tour the sewers. Our visitor area in the sewers was also damaged during the storms, with pictures, displays, leaflets and videos ruined. This all needed to be replaced for us to re-start the tours." The room we were sitting in was half full of water and it burst out onto the promenade. Now a new water tight door has been fitted between this room and the sewers.

Having seen the video we split into two parties as the first section involves some narrow passages and small rooms. "It's at this point we find out if anyone is claustrophobic" explained our guide, being seasoned underground explorers none of us were. We entered a winding 'safety passage' that links a number of sewers at a lower level. At the end of this passage below the front of Harry Ramsden's chip shop on Marine Parade, we were able to look down into the fast flowing east - west intercepting sewer running between Hove and Portobello. The murky water is about two feet deep and our guide explained that because of the fast flow all the solid material, much of it fat from local restaurants, is broken up. This and other intercepting sewers carry storm water, domestic and industrial waste water and foul water all mixed in together. There is a large trap door in the floor at this point which gives access to the 'Catch tanks'. These tanks or pits were built to collect road grit and heavy stones and need frequent clearing. Today this work is carried out late at night when the sewer flow level is low. The grit is either dug out by hand and winched up into a skip lorry above or it is sucked up by a lorry on the surface. The catch tank used to be part of the public tour but this involved climbing down a 10 foot vertical ladders and health and safety regulations now forbid this. It is considered safe to climb up a vertical ladder but not down!

We retraced our steps and then along a short passage that

brought us out level with the main east - west sewer we had seen earlier. At this point there is an overflow weir (under the Albion Hotel) taking the water into the large diameter brick lined overflow sewers. These consist of two parallel tunnels about 9' in diameter running from Old Steine Gardens, by the Royal Pavilion to an outfall beside the Palace Pier. These days, water would only enter the sea in extreme and prolonged storm conditions. A short distance along the overflow sewer is a vertical shaft, 100 foot down into the overflow tanks beneath the beach. These tanks have only filled up on two occasions. From the weir we descended a flight of stairs into the overflow sewer itself which no the north was circular and to the south was barrel shaped.

We retraced our steps and descended another flight of stairs into the parallel overflow sewer. High on the wall here is a high water mark which indicated the height of the the high tide. Before the overflow tank was constructed the sewers used to be open to the sea and at high tide the water would flow back into the sewer and up to this mark. This has now been stopped by gates that are only opened in emergencies.

We made our way down the 9' diameter storm water overflow sewer, there was a little water on the floor but this is from natural springs and we passed one of them jetting a stream of clear water into the sewer. This wide tunnel is about 200 yards long running north - south. We passed a smaller overflow sewer to our right that joined our tunnel, then another one that had been bricked up. Eventually we emerged in a vast brick lined underground chamber where we joined the second parallel overflow sewer. On our right, behind a wall was an active intercepting sewer running in its own channel and at the end of the chamber, which must have been 100 feet long, this sewer diverged, one arm running along London Road as far as the railway viaduct and the other running along Lewes Road.

We had reached the end of our tour. A short ladder, a flight of steps and another short ladder and we emerged in the sun on the edge of Steine Gardens. We walked back to where we had entered the system to collect our belongings and leave hard hats and tallies.

HISTORY

Early in the 19th century the town of Brighton, then known as Brighthelmstone, had a population of around 7000. By 1849 this figure had risen to 60,000 and many of today's familiar places were being built, including the Royal Pavilion, the Volks Railway, the Aquarium and the Brighton Pier. Just before 1860, the town decided that all of Brighton's waste water should be drained into the sea. Until then the sewage and househ old wastewater was mostly drained into cesspools at the back of dwellings. At this time very few

sewers had been laid. The few that existed were 9" diameter, constructed of 4.5" brickwork in lime mortar and called gun barrel drains. Some rain water sewers were constructed of hewn chalk with a slate bed and discharged directly on to the upper parts of the beaches. It was forbidden to connect household drains to them, although many illegal connections were made and the outfall pipes were gradually extended further out to sea. Following detailed surveys by the town council, work began in 1865 to improve the systems. The old streets were drained into 3 outfalls, one at the western boundary, one at the town centre (Albion) and one using an existing outfall at Black Rock. Each was provided with an overflow weir which would operate in times of heavy rain. About 44 miles of sewers were laid ranging from 12" diameter salt-glazed ware pipes to 8' circular brick tunnels. The inhabitants of Brighton were not content with this outfall arrangement and, in 1869, public pressure grew for an intercepting sewer; a main trunk which other sewers would drain into and which would take the wastewater out of the town altogether. When the council officials consulted several engineers they received a wide variety of proposals, including extensions to the existing outfalls, an intercepting sewer with an outfall to the west of the town near the present Hove lagoon, and an outfall at Saltdean. Sir John Hawkshaw suggested the scheme which was subsequently adopted, an intercepting sewer draining into an outfall near Portobello, which was then nearly 4 miles east of the borough boundary. This generated much controversy locally and it became a hotly argued election issue. An act of Parliament was obtained in 1870 forming a body called the Brighton Intercepting and Outfall Sewer Board. The board accepted a tender of £80,000 from Mr Matthew Jennings and work began in January 1871, but it stopped in May when contractors could not cope with the volume of water encountered.

A new contract was awarded in August to Messrs John Aird and Son and the work was finally completed in June 1874. The cost to the board was £104,608 but Messrs Aird lost £40,000 because they too had trouble with the amount of water encountered. Thirteen pumps of 20" diameter were

driven by 9 engines to pump an estimated 15 million gallons every 24 hours. The resulting intercepting sewer is circular, made of brickwork, 5' diameter from Hove Street to East Street and 7' diameter thereafter to Portobello, a total of 7.25 miles. At the Old Steine and Black Rock storm water overflows were built.

In 1865 an additional ventilator was added to the system at Rottingdean, incorporating a building which was a replica of the many coastguard cottages at that time. Many years later, this was demolished and a modern bungalow was built in its place. Another shaft, erected in 1876, was topped with a chimney standing 102' above the cliff top at Roedean. A coke furnace was kept burning 24 hours a day to draw a continuous flow of air through the sewer. The chimney was demolished in 1933.

At Rottingdean High Street the sewer is 50' below ground and receives the wastewater of Rottingdean by way of a catchtank. Up to this point the sewer has a gradient of 1 yard per mile, but from here to Portobello the gradient is 1 foot per mile. As Brighton continued to expand, the sewerage system was extended to include the new streets. Following a severe rainstorm in 1892, it became obvious that some of the trunk sewers would have to be enlarged and a system costing £25,000 was implemented. Repairs were also carried out to the King's Road sewer which was described as being old, although the original construction date was not known. Serious flooding also occurred along Lewes Road and this prompted the construction of the relief sewer in 1929.

As the urban area has expanded, so has the sewer system; 300 miles of main sewers now exist beneath Brighton and Hove. Responsibility for the operation and maintenance of the sewers passed from the Brighton and Hove Intercepting and Outfall Sewers Board to the Southern Water Authority following the water act of 1973, then in 1989 to Southern Water as part of the privatisation of the water industry.

Taken from 'Brighton's Magnificent Sewers - A Victorian Underground Masterpiece' published by Southern Water

Ramsgate

The New Civil Engineer 5/7/2001 (www.ice.org.uk) reports an award to a project team for engineering excellence. This team which was composed of several well-known civil engineering firms constructed a 2.2km road connecting Ramsgate Harbour to the A253 Canterbury. Because it cut through the chalk cliffs it needed an 820m long tunnel. The clever bit was to use a tunneling method never before used in the UK. A giant 'chainsaw' was used to cut a 200mm wide slot 5m into the chalk around the tunnel's circumference. This was then filled with sprayed concrete creating a sound preliminary lining which allowed the chalk within to be excavated. By repeating this process many times the whole tunnel was constructed.

Whitstable tunnel may be reopened

The 700m tunnel on the Canterbury and Whitstable rail line and which was closed in 1952 after 120 years of operation could be reopened as part of the National Cycle network. The only progress so far has been for engineers to declare the project feasible. Funds are now required for the next stage which is a thorough site investigation.

Both George and Robert Stephenson are associated with the construction of the tunnel.

New Railway Tunnel

The Guardian 22/1/2001 shows photograph of the country portal of the new North Downs tunnel dug under Blue Bell hill on the 68-mile long Channel Tunnel rail link

Maginot Line 2001

By Nick Catford

With the success of our excursion to the Maginot Line in June 2000 some of us couldn't wait to get back to Eastern France for further exploration and discovery. Last year we took a mini-bus but with a smaller party this time we headed for the channel tunnel in two cars on 16th August. Those taking part were Dan McKenzie, who again organised the excursion, Nick Catford, Richard Challis, Tony Page, Robin Ware, Pete Walker, Mike Clarkson and Jason Green.

Once again our base was at Thionville close to the border of France, Germany and Luxembourg. The accommodation wasn't so plush with three to a room (two in a double bed!) but it was cheap and only five minutes walk from McDonalds. Having said that, it was perfectly adequate, after all we were there to explore underground fortification not loll about in swanky hotels all day.

We made good time driving across France, I think Dan thought he was on a German autobahn and we had a chance to recce out our first fort on Thursday evening ready for going underground the next day.

Our destination was the 'Gros ouvrage de SOETRICH' 1.3 km north of the village of Soetrich. As with many of the Maginot Line forts we were able to drive virtually up to the front door along forest tracks and we quickly found the munitions entrance. Earth had been mounded in front of the entrance doorway by the French army to prevent access and although it was still possible to get in by squeezing through a hole at the top of the mound we decided to check the men's entrance 250 metres to the north. This was wide open and a quick look underground revealed an open lift shaft and the stairway down alongside.

We returned early the following morning kitted up and ready to go. Although Soetrich is a 'Gros' or large fort (housing 605 men) it is also very compact with all the fighting blocks within easy reach. We descended the stairs, approximately 60 feet below ground and immediately came to the workshops and generator room (Usine). All four generators were intact although being an open site there has been a lot of vandalism and a lot of pilfering by the many Maginot Line museums in the region eager to gather artefacts, either to display or trade. It is quite common practice for one museum to

remove vital parts, for example from the generators, to stop them being of use to a rival.

Having passed the generator room we turned through 90 degrees and immediately came into the caserne or domestic area. This consists of a number of parallel passages linking the various dormitories, washrooms, kitchen etc. Most of the rooms were completely empty although some of the kitchen appliances and preparation surfaces were still intact. Beyond the caserne we turned through 90 degrees again into the main north – south tunnel which runs for approximately 700 metres with various branches to the fighting blocks. We turned south towards the munitions entrance and after 100 metres a tunnel to the right led to the magazine. The layout of the magazine is almost identical in all forts consisting of two parallel tunnels, each with a tramway loading platform. The magazines are in rooms linking the two tunnels; in this case they were all empty. At the end of one of the platform tunnels there was a mural on



Terminal station below the munitions entrance at Latriemont

the wall giving the impression that that area had been turned into a chapel. The narrow gauge tramway is still in situ along all the major tunnels, like many forts it was powered by overhead electric cables and although all these cables have been removed as they are heavy duty copper wire, the fittings and supports are all still in place. At various places along the main access tunnel the bore widens to accommodate passing trains and for offloading. Although there are no platforms these are called stations. There were three at Soetrich 'Gare B' between the two magazine tunnels, 'Gare A' at the bottom of the lift from the munitions entrance and 'Gare C' close to the junctions to the 6 fighting blocks.

Having looked at the magazine we turned north towards the fighting blocks. With limited time it was not possible to go up into all of them as they all involve climbing many stairs, on past experience this can be anything between 60 feet and 200 feet, unfortunately you never know how far up it is until you get to the top. We decided to climb up to blocks 4 and 6 both of which contained observation cupolas and mortar turrets. The layout of the fighting blocks is generally similar. Near the base of each fighting block the access tunnel goes through two doors forming an airlock, it then splits one way going to the block magazine with overhead gantry rails for transferring the ammunition stillages (containers) to the railway trucks. The other arm goes to the base of the lift shaft, which will usually have a stairway winding around it. At the top of the stairway/lift there are two levels the lower level contains the sleeping accommodation, filters and ventilation plant and counterbalance for the turret with the upper level containing the turret and the observation cupolas. Both the turrets we saw at Soetrich were generally in good condition but could not be operated as some parts had been removed and it was not possible to engage the hand cranked winding mechanism.

Having photographed everything in sight we made our way back to the men's entrance and out to daylight. An excellent start to the weekend.

Our next fort was 'Gros ouverage du MONT DES WELCHES' in woods between the villages of Kemplich and Dalstein. Again we were able to drive up to the front door of the munitions entrance, which at this fort also forms one of the fighting blocks. Like Soetrich this is another compact 'Gros' ouverage, (522 men) of similar length with 7 fighting blocks. The workshops, generators and domestic area are all close to the bottom of the entrance slope shaft between ten parallel linking passages. The four generators were still in place but most of the other rooms had been completely stripped. Because of its very compact nature, there is no separate magazine with the ammunition being stored in the individual block magazines. We only went up into one block (Block 4), luckily little more than 100 feet above. It had machine gun and mortar turrets and two observation cupolas most of the mechanism was intact and again in good condition.

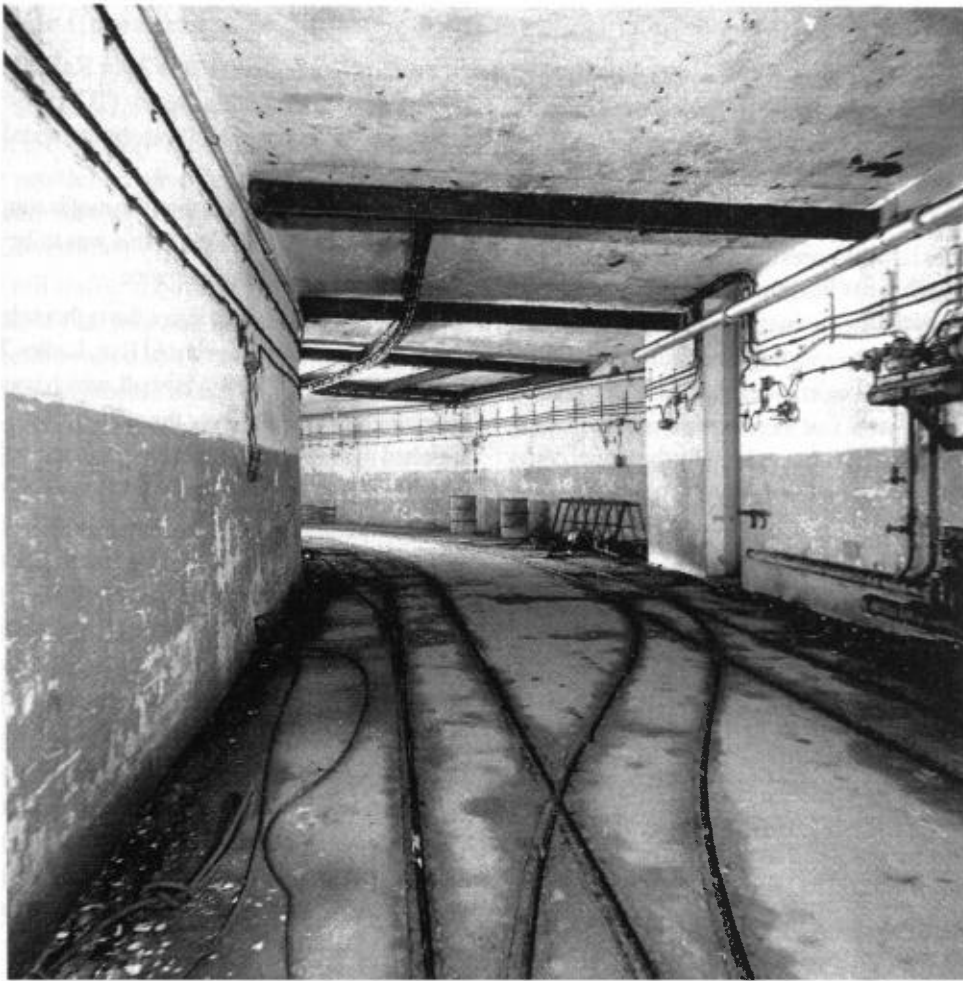
It was now getting late in the day so we headed back to base via the Maginot Line museum at Hackenburg. Although closed we were able to look at the men's and munitions entrance and then drive up into the hills where we were able to see some of the fighting blocks from the outside.

Saturday started with a disappointment. The previous year we had visited MOLVANGE and found it locked and inaccessible but the condition of entrances to the Maginot Line forts are forever changing. We had heard that the men's entrance was now open. This fort is over a mile drive along a dirt track and sure enough the entrance gate was open but beyond it an inner door that was well and truly locked. We moved on to ROCHONVILLIERS. This is a massive fortification, 2,500 metres in length with 9 fighting blocks. It was converted into a Nato bunker by sealing access to all the blocks and just using the tunnels below; it is still retained by the French army. We took a look at it last year and found security cameras and the French flag flying but nobody came out to greet us. On this occasion the flag had gone and although the cameras were still there the site looked derelict. Further investigation is needed here, if the bunker is now disused perhaps an official visit can be arranged.

Our next fort was LATIREMONT 6km south of Longwy. Both the men's and munitions entrance are alongside a farm road and are not, like the other forts this weekend, hidden in woodland. This is another Gros Ouverture for 600 men, 1200 metres to the furthest point. We were able to unlock the door to the munitions entrance but before we could go in another car turned up; it was a Belgian explorer Raoul Goulard, a veteran of many forts along the Maginot Line. He had not been able to gain access to Latiremont and was delighted to join us.

We descended 60 feet to the main north – south tunnel. As soon as we got to the bottom of the stairs we found the terminal station with five or six ammunition trucks still sitting on the narrow gauge track. We split into three parties, the explorers who wanted to see everything and the photographers who wanted to stick to a more gentle pace. Passing the magazine with its platforms and empty rooms we came to a turning on the right passing through the caserne and workshops to the men's entrance. As before most of the rooms had been stripped empty in the caserne but one or two rooms were worthy of note in particular the 'sick bay' with a folding bed fixed to the wall and a red cross on the door and the fairly complete kitchen. The workshop was particularly well preserved with a lathe still in situ and beyond it a room with an impressive mural depicting the name of the fort. Close by is a long room with electrical cabinets and switchgear and then the generator room. Two of the generators had gone but the other two were still there and appeared in immaculate condition, it wouldn't have taken much work to get them running.

We decided to look at one of the machine gun blocks, Block 5, but were disappointed to find that it has been completely stripped out apart from a periscope, which remained intact in one of the observation cupolas. While the photographers



Munitions entrance at Latriemont

were busy the explorers were determined to see everything and two of the team, Tony Page and Pete Walker managed to climb to the top of all 6 blocks. Their perseverance was rewarded when they found one of the mortar turrets still had its gun virtually intact.

For some pictures of Latriemont have a look at

www.bunker-ig.de/big/Berichte/Magnotlinie/Latriemont/latriemont.html

By now it was late afternoon and we had planned to call it a day and finish the weekend with a meal at a nearby restaurant (the previous nights we had been to McDonalds). Raoul however had other ideas. He suggested we might like to visit BREHAIN 12 km south east of Longwy in the Bois du Luxembourg. We followed him for three miles along a forestry road and eventually arrived at the munitions entrance in a woodland clearing. Both that and the nearby men's entrance were locked but we were able to release the bolts and gain access through the munitions entrance.

Again we found ourselves at the top of a 60 foot lift shaft. We descended the adjacent stairs to find the 1.7 km tunnel in immaculate condition but stripped bare. Even the supports for the overhead cables had been removed. Not everything in the fort was stripped out however; one of the magazines was still stacked with ammunition stillages, the tubular metal cases that housed the ammunition. The caserne was stripped

bare but again the generator rooms and workshops contained much of interest. One of the three generators had been removed but the other three were still in place and ready to go.

It was by now mid evening but we couldn't leave without seeing at least some of the fighting blocks despite the long walk. Brehain has 8 blocks in total and would have been home to 637 men. We walked to the two nearest blocks 5 and 6 which should have contained mortar turrets but we were disappointed to find that although the turret counter balance was still there, the turret platform and everything above it had been cut off and removed, perhaps by one of the local museums.

Although this was something of a disappointment there was still plenty to see in this rarely visited fort but we were glad to see the light of day or more accurately the stars of the night and finally made it back to a kebab take away at Thionville at 11 pm. after a very exhausting day.

On Sunday morning it was time to leave but the discussion on the way home was about what a good time we had all had and where on the Maginot Line to go next year. Dan McKenzie had already considered a trip to the Maginot Line in the Alps and Raoul had told us that he had been there and there was plenty to see despite inhospitable locations along mountainous tracks so that looks to be next years destination.

Public air raid shelters in Guildford by Nick Catford

On Wednesday 11th July 6 members of Subterranea Britannica visited the large underground WW2 Air Raid Shelter in York Road, Guildford. The shelter was constructed by digging adits into the face of the disused Foxenden Quarry (TQ000498). The quarry now contains the York Road multi storey car park but two access points to the tunnels have been retained from the entrance level of the car park. The two doors are securely locked and the shelter is not open to the public at any time.

HISTORY

The Surrey Record Office has references to this shelter in the Minutes of the Emergency Committee of Guildford Borough Council. (BR/CTME/1-3). On 11.10.1940 the Committee instructed the Borough Surveyor to prepare a plan for the construction of a deep shelter for 1,000 people. The actual plan so prepared mentioned a figure of 2,500 people and gave the view that there was no requirement to line the chalk walls, and visualised that eventually the tunnel could be incorporated into an underground highway at the end of the war in order to relieve traffic congestion in the town.

A tender for an experimental length of tunnel was accepted on 22.11.1940. On 7.2.1941 the full contract was placed with Messrs O.J.B. Edwards & Co. (Whyteleafe) Ltd. to complete in 6-7 weeks.

On 21.3.1941 it was reported that work would not be completed on time and a request for an extension to one of the tunnels by Surrey County Council 'for certain purposes' was agreed.

On 5.9.1941, it was reported that work would be completed by the end of the month. Final payment was made to the contractor on 11.12.1941. Altogether five and a half thousand pounds was paid. A telephone was installed on 5.6.1942 and heating and ventilation in December 1942 (at which time the worst of the air raids was over). In March 1943 it was proposed to convert a part of the shelter then used as a food store to a Report Centre.

On 10.11.1944 it was decided that as the shelter was then little used it would close for sleeping purposes from 20.11.1944.

On the afternoon of Thursday 3.9.1970 the shelter briefly made news. A 13 year old girl was playing with another girl and two boys by the Allen House putting green. They found a small brick building where someone had removed a few bricks. The girl squeezed through and immediately fell down a 65 ft. ventilation shaft into the shelter, breaking a leg, foot, wrist and rib. Firemen opened the doors to gain horizontal entrance to the shelter from the old chalk quarry and took her to hospital. All entrances were then re-sealed.

The multi storey car park has encroached on the first part of the two access tunnels into the shelter and two new doorways have been installed in the southern wall of Level 1. Once inside the door there is a dog-leg for blast protection which brings you in to the northern of two east-west passages each approximately 180 feet in length. The two east-west passages are linked by 6 north-south passages approximately 80 feet in length. In turn, three of these passages are linked together with a further two cross passages. One of these contained the first aid post where two toilet cubicles and the mounting for a sink are still visible. There are three pairs of male and female toilets one in the northern east west passage and in the two end cross passages. The ladies toilet consists of a number of cubicles with chemical toilets still in place and each male toilet also has a urinal.

At each end of the southern east-west passage there is a dog-leg into a short length of tunnel that ends at the base of a 65 foot ventilation shaft. Each shaft has a fixed iron ladder still in good condition and it is believed that there was a lookout post at the top of each shaft. At the southern end of the northern east-west passage there is a dog leg that leads to a section of unfinished passage this is a completely unlined tunnel cut into the chalk, it is square in section

and approximately 30 feet long. The roof is supported by numerous timber pit props. It is unclear if this was to be an extension to the shelter or perhaps another entrance.

All the wall signs remain intact throughout the shelter and are in good condition. Signs noted said Exit, Ladies Toilet, Men's Toilet, First Aid Post and Shelter Marshall, which was at the entrance to a short tunnel into a room near the main entrance. Most of the shelter is arched in section coming to a point in the ceiling. For most of its length it is brick lined but a few sections have unlined walls.

The shelter is generally in excellent condition throughout although there is a little water on the floor in places. There is a concrete floor throughout apart from the short section of unfinished tunnel where there is a very claggy chalk floor. There is evidence of fixing for bunks along both walls of all the tunnels leaving a narrow corridor in the middle. Some wiring, fuse boxes and electrical fittings remain in place.

We then looked at a collection of surface air raid shelters in Pewley Hill. These shelters are on three sides of a small public car park each with two entrances, one at either end. All but one of these entrances have been blocked with corrugated metal sheeting but this will lift at one place to give access (no time today). One entrance also has a locked wooden door.

Our third port of call was to see the Surrey Country Emergency Centre in the basement of 5 storey extension to Guildford Technical College built in 1966. The bunker has been disused for some years and has been partly used as a training and fitness centre and partly as an archive store for the college. All the archives have been removed this week and the fitness centre will be enlarged. As built, the bunker had 14 rooms but many of the partition walls have now been removed making a number of much larger rooms. A few original features remain intact, for example in the former control room there is a large scale map of Surrey on one wall with a plastic overlay showing the various sector posts. There is a blocked message passing window into the counter room alongside. 12 wood and metal bunks have been retained as they make useful shelves, there are four lots of three bunks on top of each other. The original entrance blast door has been removed and the entrance itself sealed off and a new wider doorway inserted into the wall of the generator room alongside. It is still possible to see the mounting for the original blast door. At the far end of the bunker a set of steps leads up to the emergency exit where the blast door (probably installed during the 1980's refurbishment) still remains in place. It is a fairly small steel and concrete door (it's necessary to stoop to get through it) which brings you out inside the five storey block at the bottom of the rear stairway.

There are a few signs remaining on walls and doors and some of the ventilation trunking is still in place but generally the bunker is complete stripped with fitness equipment in the former 'Liaison Room' and shelving in the other larger rooms. The male and female toilets are still in place though now modernised.

Those present were Nick Catford, Keith Ward, Dan McKenzie, Tony Page, Bob Jenner and Caroline Ford

Nick Catford 11.7.2001 (Historical notes on the Foxenden Quarry shelter by Harry Pearman)

Second World War Communication Bunkers of the Southern Railway by Mike Tyrrell

Preparation for War

The transport preparations for the impending Second World War started for all practical purposes in the latter part of 1937 with the creation of the Railway Technical Committee on Air Raid Precautions. The first meeting was held in December 1937 and examined the problem from three angles, protection of personnel, protection of vital locations, and the requirement for stocks of spares. Having determined the protection required, the schedule of locations was drawn up, costed and submitted to the Government.

It was agreed that rail traffic should be kept moving during air raids so this had a fundamental effect on the form and extent of the protection required. New construction work at this time would be to a protected standard but on the existing system estimates for the work required to protect the personnel continuing to work under attack from the air were prepared. Protection of property included that for administration and control of rail traffic and further provisions included extra telephone connections on railway networks and with GPO circuits together with supplies for restoring communication following the expected damage.

The estimates of cost were far more than the railways could meet from their own resources so the Government were advised that nothing could be started until finance was forthcoming. In September 1938 the Railway Executive Committee was formed out of the Railway Technical Committee, initially to advise Government of the powers needed by the railway companies in the event of war. After the initial crisis passed the committee continued in being until September 1939 when it assumed Executive powers to control the operation of the railways.

Prior to the outbreak of the Second World War on 3rd September 1939 the Southern Railway had no formal telephone based traffic control system. It was evident to the Government that the Southern Railway would take the brunt of increased wartime traffic to France and was in danger of damage and disruption by enemy action from the air. To meet this threat a new Traffic Control network was installed in 1940 with the control installations located in purpose built partly underground bomb and poison gas proof buildings. A number of key telephone exchanges were also relocated to protected accommodation.

The War Time Organisation

The Railway Executive Committee (REC) was to assume executive control over all railways, including London Underground, being formed of the General Managers of the Railways using seconded staff to set up its control and administration functions.

The railways continued their day-to-day operation under their General Manager, inter company coordination being undertaken by the REC.

The Sites

The REC needed a protected location for its headquarters and in March 1939 a site at the abandoned Down Street Tube Station on the Piccadilly Line was selected and construction started immediately. It was not completed by the outbreak of war on September 3rd 1939 but occupation was undertaken nevertheless.

The Southern Railway had five underground control sites. Four at the wartime locations of the Divisional offices, and one at Headquarters together with other telephone exchanges located at strategic locations throughout the SR trunk telephone network.

Railway Executive Committee

Down Street station was fitted out with offices and living accommodation constructed on to the space where the platform was originally located and into the connecting access passages.

REC, Down Street. Access to the complex was via the original emergency stairs, fitted with a lift. The original life shaft by this time being used to ventilate the Piccadilly line. Both shafts were protected by concrete slabs. The installation contained offices, meeting rooms, messing and kitchen, bathroom, toilets and bedrooms. All ventilated and gas tight. In emergency the staff could stop passing trains with a special signal at their own short platform which was just long enough to gain access to the drivers cab of a passing train. A two-position switchboard was installed with direct lines to government offices and key railway locations.

The building had no postal address and the telephone number was transferred from an office in Westminster so as not to betray its location.

Traffic Control

Traffic Control underground bunkers were built as part of the construction of each of the wartime divisional office and headquarters locations.

South Western Division	Woking
Western Division	Southampton
South Eastern Division	Orpington
Central Division	Redhill
Headquarters	Deepdene House

Woking

The bunker was located within the Divisional office hut complex located at the down side of the line at the London end of Woking Station. It was partly buried with an earth covering. The switchboard remained on the upper floor of the Down side station building through the war.

Southampton

On the up side of the line at London end of Southampton Central station. It was a concrete building cut into the embankment, which is now used as the foundation for the current railway telephone network Southampton exchange.

Orpington

On the down side of the line at the London, behind the old engine shed. It was part of the hatted divisional office

complex. The building was partly buried with an earth covering. In addition to the Control this bunker housed the switchboard.

Redhill

On the down side of the line at the country end of the old engine shed then used with the hutted complex for the divisional offices. It is not known if the switchboard was underground. The building was partly buried and the later canteen building was built on top. After the war the Control was moved into the canteen building, with the local telephone exchange located at the country end of the building, when the Control moved to Croydon, the building became the Redhill telephone exchange.

Each Divisional Control bunker contained the control room, equipment room, air plant room and battery room in a gas tight and bomb resistant building.

Deepdene

When the Southern Railway took over Deepdene House for its wartime Headquarters it discovered that there were natural caves in the grounds. These caves had been acknowledged 300 years before in the diaries of John Evelyn. Because of the natural protection afforded by the location of the caves they were eminently suitable for the development of a bunker to house both the sites switchboard and the Traffic Control. The lawn between the caves and the house was used as a site for the 99foot mast supporting aerials of the emergency radio. The bunker was constructed within the caves to house the 30 staff with a Control room, meeting room, 3-position switchboard, battery room, MDF/maintainers room, a bedroom for the night officer and an air plant and toilet facilities. A 60-foot vertical shaft at the rear of the complex provided an air inlet and emergency exit. A 4foot thick concrete slab covered the complex but no protection was provided against a 'near miss'. The Southern Railway General Manager Eustace Misspending lived nearby and had a switchboard extension in his house. During the air raids he spent many nights there with his wife and it is reputed that the Prime Minister, Winston Churchill was a visitor.

The General Telephone Network

Other communications bunkers were constructed to protect the telephone exchanges at vital locations. Those currently known are described below

Southampton: Outside Dock House in Southampton Old Docks was built to contain the Southampton area telephone exchange (which served the traffic control at Southampton Central Station).

Waterloo: The telephone exchange was located in one of



Deepdene; The three switchboards

the arches below the buffer line of platforms 1 to 8 at Waterloo Station. Entry was from a public passageway leading to the Waterloo and City Line station. A single door gave entry to a long closed passage with an entrance off to the left to a separate area where the temporary switchboard was located whilst the exchange was moved from the 4th floor of Waterloo General Offices. Half way along the passage was a weir two or three steps high to keep out floodwaters, past the armed guard, and into the gas lock built into the supporting brickwork. Once inside the complex, the visitor went past the air plant and gas filter room on the left and into the main corridor. On the right were the exchange supervisor's office and the door to the switchboard room. A narrow corridor, later removed, ran down the length of the switchboard room to the apparatus room beyond. At the far end of the equipment room was a smaller room for the carrier equipment. A second gas lock gave access to the battery room and generator room and an exit door to The Colonnade, one of the access roads under the station. Returning to the main corridor the first room on the left was the Maintenance Inspectors office and the second room was the main workshop, where major repairs and construction of switchboards and signal box equipment was carried out. Beyond were the mess room and stores for the strategic stocks of vital spares. On the right were the operator's rest room and the toilet block. At the far end of the main corridor was a further gas lock providing an emergency exit to the lost property office located under Waterloo General Offices. The complex was protected by a concrete slab pored into the crown of the arch which had been excavated down from the concourse level above.



Brighton; Switchboard room

Brighton: A narrow staircase was cut from what is now platforms 5 and 6 down to the arches under the station. This tunnel was originally constructed for the railway tracks to the lower goods depot. A strengthened room was constructed to house the switchboard and its apparatus.

Chatham: A short tunnel was dug into the cliff face at the London end of the down sidings. It housed the switchboard and 1 + 1 carrier terminal to Swanley and Orpington.

Dover: A tunnel into the cliff somewhere near Archcliffe Junction is thought to have housed the Dover switchboard. The PABX at Dover Marine terminal was recovered and stored for the duration of the war.

Dorking North: A hut complex was constructed on the down side at Dorking North station occupied by the finance audit section evacuated from Waterloo. There was a bunker called "the control" as well as air raid shelters for the staff of the huts. There was a switchboard at Dorking North which was located in the first hut as you entered the site. No Traffic Control is known to have existed at this site.

Feltham Yard and at other locations not known to me: Some bunkers may have been air raid shelters for switchboard and other staff but many were probably used by the local freight wagon controller or yard supervisors who were vital in keeping traffic moving on the railway.

Radio Communication

Fourteen fixed and six mobile radio stations were installed at the beginning of the war, to allow train control communication to continue in the event of disruption to the fixed telephone network. Installations were located at the five control sites, Waterloo and at other strategic locations. The system only had to be used twice during the war, in May 1941 and again in May 1942.

After the War

Following cessation of hostilities the Divisional installations were transferred above ground and the Headquarters returned to Waterloo. This peace was not to last, use of the underground installations was resumed as the onset of the "cold war" led to the reinstatement of equipment racks below ground so that in the event of need, the relay sets and controllers keyboards

(and staff) could be quickly transferred to safety. This facility was never used, and by the middle of the 1960's were recovered to be replaced for a short while by the same equipment installed into trains kept warm and dry in a siding somewhere. These trains were equipped with switchboard, control racks, batteries and generator, communication radio and miles of cable interconnected by plugs and sockets. They were never used; obsolescence set in, and slowly the contents were broken up for spares.

Waterloo exchange continued in use underground until replaced by a new site in Spur Road in 1964. The tunnels continued in use for many years as workshops, stores and offices for the Southern Region Telecommunications Works organisation.

The war time Southampton Docks Exchange continued in use until replaced in 1958, by a new installation at Southampton Docks housed in a new building constructed on top of the bunker. The Southampton Docks exchange continued in use as the Southampton local exchange until 1963, when the old exchange was recovered and the bunker was retained in use as workshops, stores and garage.

The Southampton Control bunker became the foundation for the new telephone exchange building constructed to allow the final closure of the old exchange at Southampton Docks. It was later used as a store.

Further Information

This article is written from personal recollection so errors and inaccuracies are possible. If anyone has any information it will be used to update future issues.

Southern Railway Regional Control Centre and Divisional Control Rooms

by Nick Catford

During World War 2, the Southern Railway took over the Deepdene Hotel near Dorking in Surrey (NGR TQ174491) for its wartime emergency headquarters. In the grounds they excavated an underground control centre taking advantage of network of existing natural caves. The tunnels housed an underground telephone exchange serving the Southern Railway Headquarters in the former hotel. The switchboard was a three-positioned installation with Post Office lines and extensions serving the headquarters staff with direct lines to the various divisional traffic and engineering officers. The switchboard was in use 24 hours a day.

The night staff of the Operating, Motive Power, Chief Mechanical Engineer, and Chief Electrical Engineer's Departments also worked in the tunnels, which accommodated a total of 30 clerks. Among the accommodation was a meeting room suitable for any conferences which might have to be held under emergency conditions. The tunnels were well ventilated and the temperature was regulated by radiators in each room.

Among the features of the control centre were diagrams of all important junctions on the Southern Railway, giving staff immediate access to all information necessary to enable them to make emergency or alternative arrangements for any diversion of traffic necessitated by damage caused by enemy action. Each of the rooms was fitted with a radio receiver for the reception, under emergency conditions, of any important Government announcements which might have been broadcast. The underground control centre remained operational until the mid 1960's when British Railways moved out of the Deepdene Hotel.

The underground control centre consisted of a series of tunnels driven into the steep hillside to the rear of the house. There were three entrances plus a fourth emergency exit accessed from the hillside 50 feet above via a spiral staircase.

Deepdene Hotel was demolished in 1969 and a modern office block built on the site, this is now the Headquarters of Kuoni Travel. For many years the tunnels lay forgotten in the bushes to the rear of the offices but in 1997 local children started a small fire just inside one of the entrance tunnels and when the fire brigade came to extinguish it they found the whole network was heavily contaminated with asbestos, so much so that they had to dispose of all their clothes after the incident.

As a result of this information, Kuoni commissioned a survey of the tunnels by Redhill Analysts who confirmed that most of the complex and two of the small surface buildings were heavily contaminated with both white asbestos (Chrysotile) and blue asbestos (Crocidolite). Shortly

afterwards all four entrances, and the contaminated surface buildings were sealed.

In June 1999 Kuoni allowed a party from Subterranea Britannica to break into the tunnels to carry out a photographic survey and although English Heritage had previously been turned down permission was granted on the understanding that the entrance was repaired the same day and those people entering the tunnels signed a relevant disclaimer.

It was decided to force an access into the small blockhouse above the emergency exit 50 feet up the steep wooded hillside behind a grassed recreational area to the south east of the office block. The entrance consists of a small square brick building with a sloping roof. The doorway had been sealed with concrete blocks, we removed several course of these to gain access to the 79 step spiral staircase. At the bottom of the staircase the tunnel turns through a 270 degree dogleg for blast protection before entering the main north-south tunnel that is divided into 6 'rooms'. All internal wooden doors have been removed but the doorways remain intact. The first room contains the remains of the ventilation plant with ducting leading through into the rest of the network.

The next room south (R2) is about 30' long with an arched concrete roof supported on steel hoops. Apart from the ventilation ducting high on one wall and an old telecommunications box on the floor this room is empty.



The Night Officer's Room

R3 to the south is square in section with a concrete roof supported on steel girders. There is a junction with R7 half way along the west wall that also carries the ventilation ducting. There are heating pipes along the east side with a pile of fire damaged asbestos panels leaning against the wall.

R4 contains rusting telephone switching racks with some of the panels still in place. This leads into R5 that is the hub of the control centre

with tunnels leading off in three directions. Against one wall are the remains of three floor standing switchboards. The final room south (R6) has battery terminals on the walls and would probably have contained the back up power supply for the telecommunications equipment. There is a dogleg to the south leading to entrance No. 3 and the external boiler house. The external door is still in place and locked but there is now a concrete block wall in front of it.

Returning to R5 an east - west passage runs through three rooms. The first (R12) is 'T' shaped with an electrical switch box on the north wall. To the south there is a blast wall and entrance No. 2. To the west R13 has an arched roof, this room was the site of the fire. This leads into a small square room (R10) where it joins the second north - south passage. R14, which has an arched concrete roof curves round to the west and entrance No. 1. North from R10, R9 also has an arched roof and apart from some pipe brackets on the wall is completely empty and free from debris. R8 is another square room leading at right angles into R7. This long room is also completely empty and links back to the main north - south passage.

As well as the ventilation ducting throughout the network, much of the wiring is still in place together with switches and light fittings. The tunnels are all of concrete construction with the walls lined in brick. Unless stated, all roofs are flat concrete supported on steel girders.

There are three external buildings. To the south of entrance 3 is the boiler room which was not entered. This building is heavily contaminated with asbestos and has been sealed. Close to entrance two is a rectangular building. This was the external toilet block. Like the boiler room this is also contaminated and has been completely sealed. A third rectangular concrete building lies on the other side of the recreation area. This building is still open and its purpose is unknown. There is a disused telegraph pole beside it. In the



The Control Room

woods to the south of the site are three parallel lines of anti-tank pimples (dragons teeth).

After concluding a photographic survey the concrete block wall across the emergency exit was repaired and the site is now secure. Kuoni have made it clear they wouldn't welcome any further requests for access.

In addition to Deepdene three divisional control rooms were built to regulate the flow of railway traffic on each of the three divisions (South Western, Central and South Eastern) of the Southern Railway, later Southern Region. The controllers would take executive decisions as to which trains have priority, how to allocate scarce resources and so on. In this connection they were provided with dedicated 'Control' telephones to every signal cabin in their Division and to other strategic locations (e.g. other control offices, main motive power depots, Electrical Control office, etc.). In more recent times there was also a Control teleprinter network as well.

The three divisional control rooms were located close to the stations at Orpington, Redhill and Woking and like Deepdene they remained in use until the mid 1960's.

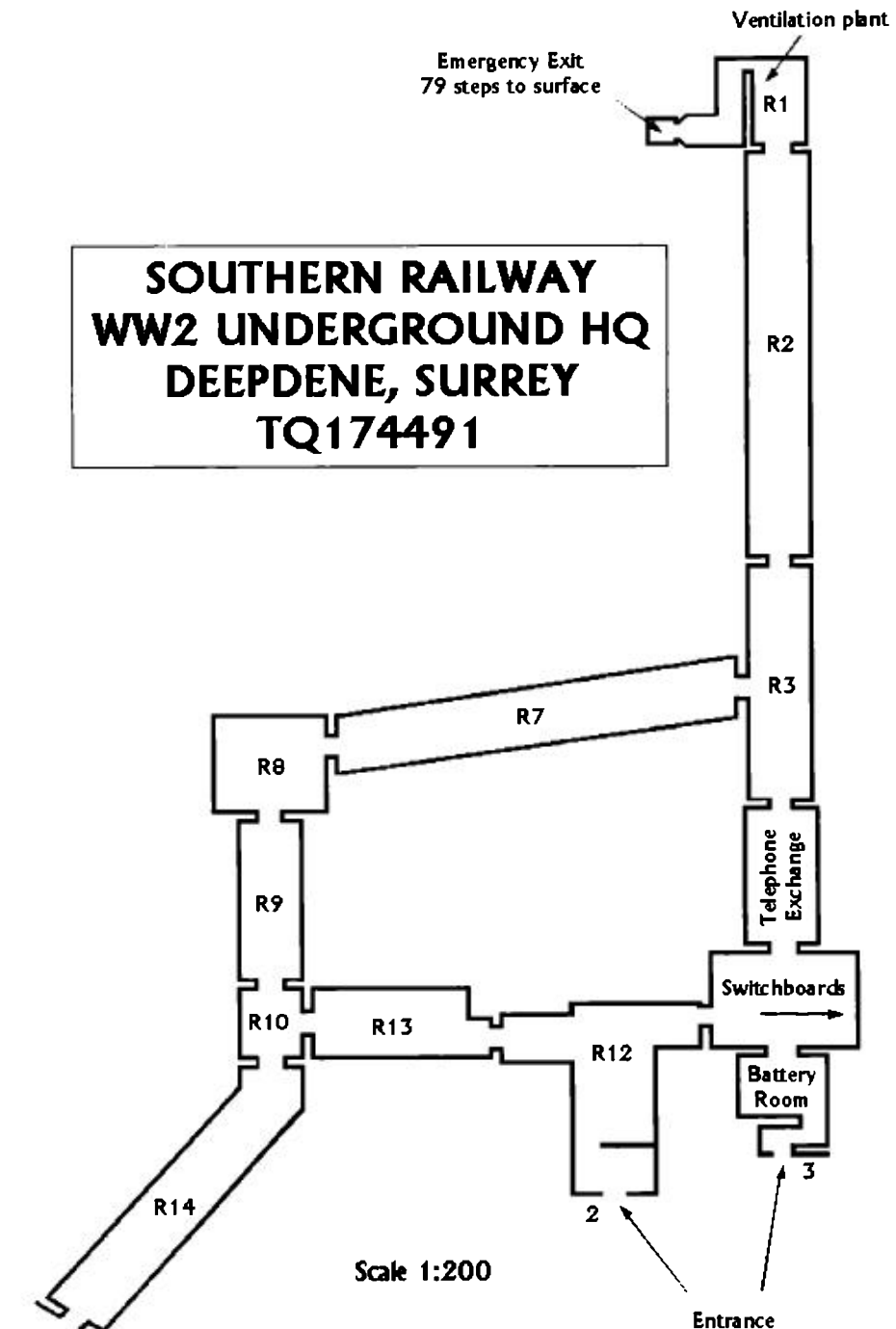
The Orpington control room is located at the rear of the former engine shed on the eastern side of the station behind the bus station (TQ45456605). There are two entrances, both protected by blast walls. One is alongside the footpath that runs beneath the railway line. This has been bricked up with rubbish piled between the blast walls. The other entrance is on Railtrack property behind the engine shed, which is now used as a staff rest room.

The entrance, which is under a covered concrete roof resting on a brick pillar, consists of a steel gas tight door with a small circular glass window at eye level. Inside the door, a flight of stairs leads down into the bunker. At the bottom of the stairs was another gas tight door, forming an air lock,

but this has now been removed. A doorway to the right was bricked up in the 1960's when two rooms in the bunker were used as a BR social club. From the stairs there is a short corridor then the passage turns at right angles to the left where there is one room to the left. This room is now completely filled with rubbish, much of it from the former social club. Straight on is the ventilation and electrical plant room. Much of the ventilation trunking remains but the fan and filters have been removed. Small square section trunking goes through two walls at ceiling level to ventilate the rest of the bunker and can be seen in all rooms and corridors. There are two large metal cabinets one with a connection to the ventilation system. They are lying on top of each other on the floor and as they are empty it is unclear how they

fitted into the ventilation system. There are two concrete blocks along one wall and to more free standing concrete blocks along another wall. There are no obvious mountings and it again is unclear what their use was. There are numerous electrical switches and fuse boxes mounied on one wall.

A hole has been made (by Railtrack staff) in the bricked up doorway giving access to the rest of the bunker. This leads into a long room, which still contains much of its original furniture (desks, tables, shelves etc.) painted green and in poor condition. The gas tight door from the bottom of the stairs is lying on the floor. There is some wording on the inside of the door 'Air Lock - Upon receipt of a purple, red or gas warning close all steel doors when entering or leaving the shelter. The first door must be closed before opening



the second.' There are some more electrical fuse boxes on the wall. At the far end of the room a corridor leads to the right. There are three small cubicles on the left hand side of this corridor, each is timber lined with a light fitting, and one has two shelves. It seems likely that these were communications booths. Beyond the booths is another long room on the right, similar to the previous one. This room is completely empty and the floorboards are rotten. The corridor continues past this room, there is a dogleg to the left and then a similar sized room on the left hand side, this too is empty. On the same side of the room as the corridor is another gas tight door. The word 'Air Lock' is still visible but the other words cannot be deciphered although they appear to be different to the other door. Behind the gas tight door is a wooden rifle rack for six rifles that would have been used by the Home Guard. At the top of a short flight

of steps is another gas tight door forming an air lock. Beyond this is the bricked up second entrance. All internal wooden doors have been removed but some of them are leaning against a wall.

Externally the bunker is covered with earth and there are small trees and bushes growing on the top. At one end, above the plant room is the ventilation shaft.

The Redhill bunker is located at TQ281503 immediately south of the old Goods Shed at the back of the station car park. There is a rectangular mound covering the bunker and a single storey brick building, now housing the AMEC Estates Managers Office stands on top of it. One entrance is at the north end of the mound where modern double wooden doors give access to a stairway down. The other entrance is on the west side of the mound facing onto the railway line. Here there is a single wooden door giving access to a stairway that dog legs down into the bunker. At the southern end of the mound there is a large metal container and adjacent to this as the ventilation shaft consisting of a squared conical concrete pillar with a ventilation pipe on top of it.

Following closure the bunker and the building above it remained empty until the mid 1980's when British Rail's permanent way team at Redhill required new premises as their old huts were due for demolition to make way for the new station car park. The brick building on top of the bunker seemed ideal for the purpose. It had housed exchange equipment and all the remaining switching frames and a back up power supply of heavy duty batteries were cleared at this time and new partition walls inserted inside the building. Two of the rooms inside the bunker were also utilised.

A door in the rear (opening on to the railway) of the surface building leads to the main access into the bunker. Having entered the single door the passage turns immediately through 90 degrees to the north where there is a flight of 8 steps down into the bunker. At the top of the stairs is a door on the right. Entering the door and turning right another flight of 9 steps leads to the plant room. At the bottom of the steps are two doors one to the left and one straight ahead. The room on the left still contains some original furniture while the room on the right contains the ventilation plant and electrical switchgear. All the plant and ventilation trunking appears intact. There is a large metal cabinet lying on the floor, it is unclear how this fits into the ventilation system but it is similar to the cabinet seen at the Orpington bunker. The trunking is connected to an intake pipe high in the end wall connecting to the ventilation shaft at the southern end of the bunker.

Both these rooms are flooded to a depth of 10" and were not part of the 1980's conversion. At the bottom of the other flight of stairs a door to the right leads into the former control room. This was a long thin room which has now been divided in two rooms (one longer than the other) with a partition wall and a linking door. At the back of the second room is a brick wall with a door into the final room of the bunker. There's a circular hole in the long wall which leads to the

exhaust ventilation shaft and on the far wall numerous cables (now cut off flush with the wall) enter the building. A door at the far end of the long wall leads to a flight of 12 steps up to the emergency entrance now consisting of twin wooden doors.

All the ventilation trunking in this section of the bunker has been removed, the walls have been painted white and the lights are working. There is some storage in the three rooms but as these rooms also flood in wet weather storage is kept to a minimum and well off the floor.

The Woking control room is located at TQ009588 at the western end of the eastern station car park, accessed from Oriental Road. The only visible entrance is in a mounded bank with two wooden huts on top, these are still used by railway staff. The entrance consists of a replacement steel door giving access to a stairway down. There is a concrete slab protruding over the entrance and resting on a brick pillar giving blast protection (similar to Orpington). Despite walking right round the mound there is no obvious second entrance although it could be inside one of the buildings as they appear to be contemporary with the bunker. There is a concrete pillar along one side that may have been the ventilation shaft but this is now capped with no obvious ventilation pipe. The steel door is locked with a strong metal bar and one room is used by an electricity company. When visited in 1981 some of the telephone exchange equipment and furniture was still in place. (see transcript of newspaper article below). It has not been possible to gain access to this bunker yet. The car park and entrance, which is on the south side of the railway line is sunken and hidden from the line by other railway hutting. In the bank on the north side of the car park (along side the railway line) are two air raid shelters, both emergency exits are visible and one (TQ00885882) can be entered although it is tight.

TRANSCRIPT FROM

Woking Times Review 17.10.1981

Is there a secret shelter beneath Woking's streets? Richard Darring asked in a Review article a year ago. He reported on a controversial book by Peter Laurie entitled *Beneath The City Streets* in which mention was made of Woking's Southern Railway Divisional headquarters instituted at the start of the last war. Peter Laurie stated in his book that all traces of 'Woking's tunnel' had disappeared, but if he had dug a little further in the right places he would have found all sorts interesting things about the towns 'battle headquarters'. Researcher and writer - Peter Bancroft and Review photographer Andrew Higgins have found the "secret tunnel" and have been to see it. Here are the facts.

That the clouds of war had been gathering over Europe for some considerable time before September 1939 is undisputed, and all of the Big Four railway companies had themselves been very conscious of this fact. The Southern Railway had taken several positive steps long before the start of the war, which principally involved a planned decentralisation of the stores departments and the administrative offices of the company. Their emergency

headquarters away from the London area, which would undoubtedly be subjected to bombardment from the air, was to be in a large and imposing country house at Deepdene near Dorking. Another house at Elmstead Woods in Kent, and some space in the old locomotive works at Brighton were also taken and set aside for offices. In addition to this accommodation, there were to be three divisional headquarters located at Woking, Redhill and Orpington, each one having its own re-enforced underground chamber for the control staff. These "Battle Headquarters," as they were sometimes called, were occupied from the very start of the war. The Woking headquarters was to control the extensive "London West" area. Woking station itself was the hub of London West Division Area Number 4, controlling the old South Western main line from Byfleet Junction down to Winchester Junction, together with various important connections to other lines and the two branches leaving the main line at Brookwood, one into the Brookwood Cemetery, and the other to Bisley Camp and Pirbright (both long since closed and lifted). These control arrangements continued during and for many years after the war, and even in its later years the Woking Underground control office boasted some nine controllers, each with telephone facilities, having direct contact with all the signal boxes in the various numbered areas. Apparently most of the controllers were to note the passing times of every train at various points in their respective areas, in order to establish early or late running and monitor traffic movements generally. With their special ability to divert traffic around any incidents, i.e. breakdowns, derailments, engineering works, etc. These arrangements were presumably very much the same in wartime, with added interference to traffic from air attacks. A locomotive control man and a driver's guards control man were also part of the team, with their own special tasks of co-ordinating provision of motive power and planning crew duty rosters.

Two revealing pictures of the wartime use of the various underground control rooms, were given in "The Railway Gazette" issues for 18th October 1940 and 21st March 1941 (Pages 414 and 330 respectively) though at the time their location was not stated for reasons of security. However, neither picture appears to be of the Woking office.

Also at Woking, a wireless van was parked at the end of a short siding, near to the unloading bay at the east end of platform 5. That was one of 14 fixed radio installations provided during the war, which could be used in the event of dislocation of the telephone system by enemy action.

This system was only used twice during the war, once in May, 1941, and again in May, 1942, resulting from heavy raids in the London and Exeter areas respectively, causing damage to telephone lines. The importance of Woking as a traffic centre may be illustrated by the fact that the station had played an important part in the final movement by rail, of many troops brought back from Dunkirk. A number of these troop trains were reversed at the station on their way to more distant parts, having arrived by way of Redhill from the Channel Ports

This in itself was a headache because there was no turntable at Woking for the locomotives. The problem was overcome by sending the engines "running light" up to the bay platform on the up side at Weybridge, and then running via the spur line to Addlestone Junction and round again to rejoin the down main line at Byfleet Junction, to face the right way round for westbound departure from Woking. Doubtless the controllers worked overtime in their underground office during this period. The build up to D Day would also have required an large amount of troops, munitions and stores train movements, all carefully planned and monitored by the various control staff. With permission granted by Mr. Graham Coombs. (BR Public Affairs Department) and the supervisor of Mr. R H. Gosling (Area Civil Engineer, BR South Western Division) we visited the Southern Railway Woking underground control office.

As the photographs shows, the shambles and dereliction of the place today does not do credit to its former strategic and vital service in the dark days at the war. Indeed our visit seemed quite an anti-climax after so many great expectations of this strategic place. The main control room is perhaps 10 or 12 feet wide and about 20 feet long with air locks leading off at both ends up to the surface entrances. The air locks consist of steel doors with small glass panels and bearing inscriptions that read ' Upon hearing a purple, red or gas warning close all steel doors when entering or leaving the shelter. The first door must be closed before opening the second.'

Parallel to the main office are four smaller rooms, entered through a third door from within the air lock at the east end of the shelter. The last of these four rooms is also connected directly to the main control room at the west end via a small door. These smaller rooms had contained a telephone exchange, warm air ventilation plant, electrical control apparatus, and one room is currently in use by the local Electricity Board as a substation, presumably supplying the offices above. There were no toilets provided in the shelter and the walls were apparently just whitewashed.

There is of course, no access to the public, the shelter being on British Railways private property. Anyone found trespassing is therefore liable to prosecution So Mr. Laurie, I must disappoint readers of your book, in so far as exploding the notion that this might be some secret Government shelter, manned and ready in the event of a nuclear attack. Instead only the shattered remains of a once bustling wartime railway underground control office.

Are any other locations mentioned in your book In the same state as this one? I do not know. Certainly the people of Woking need not rush to this particular shelter for protection. But has Woking any other more modern shelters? Now who was it said that the basement of the new council offices took a long time to build ? I wonder.

There are three pictures published in the paper, one shows the gas tight door with the inscription, one shows the main office with desks along both walls and the third shows some of the racks of electrical (telephone ?) equipment still in place.

Visit to the Marsham Street Rotundas and Steel Framed Building

by Andrew Smith

Thursday 28th June 2001 saw 7 members of Subterranea Britannica visit the 2 Rotundas and Government. Citadel in Marsham Street, London, SW1. The trip was fully sanctioned by the Home Office and we were accompanied throughout by 2 members of Home Office staff.

The underground complex consists of 3 'bunkers' the North and South Rotunda and the Citadel, often referred to as the 'Steel Framed Building'. The Rotundas started life as gas holders and were converted during the last war and with the addition of the steel framed building they housed the Air Ministry Staff, the Home Security War Room and the London District Army Command. After the war the Rotundas played a part in the Cold War linked by a series of tunnels to other government buildings. Eventually the South Rotunda was converted into a huge Civil Service sports and social centre while the North Rotunda housed Federal, Horseferry Tandem and other Government telephone exchanges. The steel framed building also housed government telephone exchanges and was most recently used as a command centre during the Gulf War. Each of the three bunkers supports one tower block now empty but until recently used by the Department of the Environment.

The entire Marsham Street site is scheduled for demolition in the autumn of 2001 and agreement has almost been reached with the PFI developers to commence work. Due to the size of the structures it will take 12 to 18 months to complete demolition and the new buildings will not be finished for some time after that. The 3 large tower blocks on the site together with a couple of low level buildings, the steel framed building and the Rotundas themselves will all be demolished to make way for new buildings.

In recent times the tower blocks have been used as a Christmas shelter for the homeless and there has been a continued problem with people rough sleeping in the extensive and warren like complex - we saw some evidence of this on our tour. The site has a substantial hoarding around it now and steps have been taken to remove the homeless people prior to the demolition although our hosts indicated that there were still problems in this area. At points in the past homeless people had barricaded themselves into parts of the building and left themselves escape routes in order to leave when ousted by the security staff but gain access back in at a later date via unsecured doors etc. One group after eviction turned up at the security gate and asked for their gear back which they had left behind which included a microwave oven and portable TV!!!

We started at the Government Citadel which we reached by descending into the car park below the main building and walking through the plant areas to a small corridor. Passing through a safe type security door we then passed through an old fashioned blast door

and into the Citadel. This was abandoned in 1996 and was still in reasonable condition. Built on 2 floors it consists of a rectangular shaped block with a central spine corridor. Almost identical on both floors in terms of layout this was our taste of things to come. Coming through the dog leg just inside the door the first room on the left is the former Naval Comcen and it still has it's sign on the door. This room, like every other, is totally stripped although the power sockets have been left on the wall. There were 2 totally separate power circuits and those finished in red plug tops were marked 'UPS Power - smoothed'.

Walking along the corridor it was easy to see the substantial steel reinforcement work above our heads which was structural to the building but also gave added protection to the Citadel. The Citadel itself was last used during the Gulf War. All the rooms along this corridor were empty and we entered almost every one. Some had name plaques on the door. There were male and female toilets on the right hand side mid way along. Reaching the end of the corridor we turn right and the next room on the right contained a large wall map of the world in excellent condition. It was not possible to remove this map as it was bonded to its' mount. We re-traced our steps and descended to the lower level which is much the same as the upper floor in terms of empty rooms etc. A room on this level also contained a large wall map in excellent condition. This was a large scale map of



The curved internal wall clearly visible here

the central European and Balkans area. We walked along this corridor to the very end where we descended a few steps into a tunnel. Mid way along this tunnel there was re-enforcing steelwork being used to support the roof where a WW2 V1 rocket had hit during the war and made a large dent in the structure. This corridor led to one of the Rotundas but we re-traced our steps and exited back to the car park and across the surface to the South Rotunda.

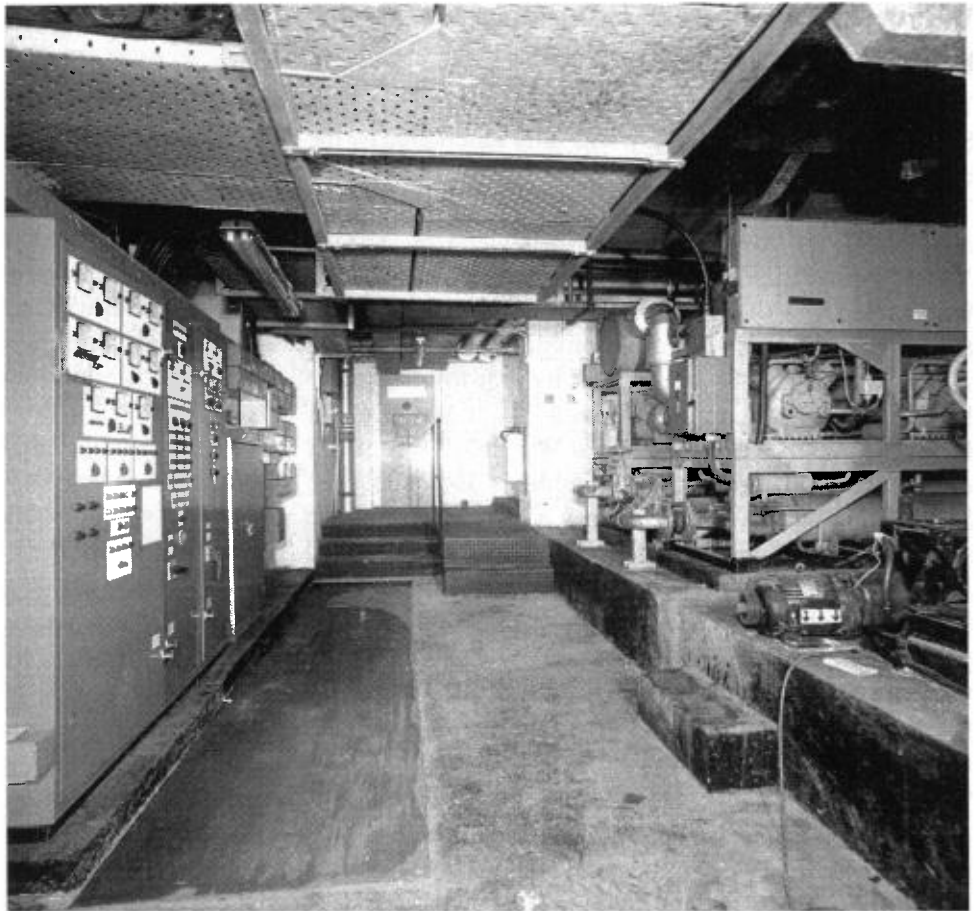
Entering via a flight of steps we passed through a security door and into the Rotunda itself. Both Rotundas have 3 levels and are almost identical in layout although recent uses have been quite different. We descended to the lower level and entered the totally intact and working plant room. This room was on care and maintenance until early 2001 and there was a full time engineering staff of 3 who managed the equipment and kept the heat on

during the use of the site as a homeless shelter. The plant room comprised of generators, boilers and air compressors and was also the home of the sewage ejector system. Working our way around this areas we also saw 'The Crescent' which is an area adjacent to the diesel tanks that illustrates the curvature of the Rotundas structure.

Upstairs the remainder of the building has been used as the Civil Service sports and social club. Just about every sport from Boxing to Snooker seems to have been played here at some time. The rifle range is still in tact (with targets) and there is even a snooker table left behind amidst the mess. Further along the corridor is a boxing gym and Karate Dojo and the Boxers' training room still has that certain smell about it and the walls are plastered with promoters sheets for boxing matches with the like of Frank Bruno amongst others together with newspaper cuttings of boxing stories.

The top level hosted a cinema-cum-theatre with a prop room nearby. Much of the site is strewn with rubbish and there is extensive evidence of vandalism and graffiti in this area. There are a number of kitchen areas throughout the building. There are several bars throughout the building and in one of these there was evidence of someone sleeping rough as they had left behind their blanket and beer cans. It is unknown if that person was in the building at the time of our visit but our hosts commented how the security staff were reluctant to tour the building on their own.

We completed the tour and made our way back to street level. The North Rotunda is currently having asbestos removed from it prior to demolition so we were not allowed to tour but our guide did permit us to visit a small area of



One of the plant rooms in the South Rotunda

the lower floor where the site offices are located. Our guide led us along the corridor to a locked door. He opened it and we entered. We were standing in the last remaining BT telephone switch and distribution room for the Government Telecoms Network on this site. (GTN)

The room is huge - about 10M wide by 30M long and contained a huge number of disconnected BT circuits. Each of the rack sets had a red notice on them announcing that the circuits were discontinued and that if anyone wanted to connect something to them they needed to contact the BT engineers. One block of lines were still connected. These were for the security staff and the emergency phones in the lifts in the tower blocks. The area we walked through to reach this room had also housed telecoms gear but this had been stripped out by BT and the final room was due to go just prior to demolition. We were very lucky to see this room.

We then visited the room which housed the defunct SX2000 (ECN) telephone exchange which had only been used for 6 months prior to being scrapped. This unit has been donated to English Heritage and will be installed in their recently scheduled ROC Group Control bunker at Acomb on the outskirts of York. Our hosts generously gave each of us a Home Office telephone handset as a souvenir and we exited to the surface.

I would like to take the opportunity to thank the Home Office for being so accommodating (our visit was the longest they had ever done to the site at 3 hours in duration). The entire site was extensively photographed.

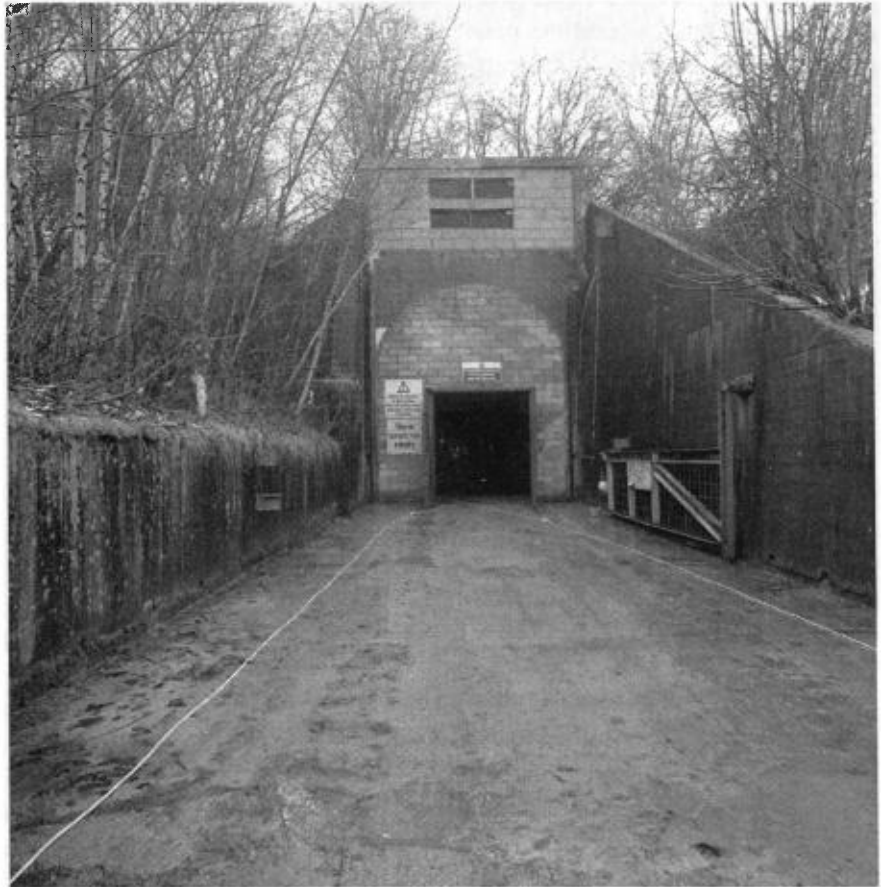
VALLEY WORKS, Rhydymwyn, Mold, North Wales.

History - by Ian Davies

The Alyn valley in North Wales has been used by the UK government for storage of sensitive material for most of this century. The geology of the area is extremely useful - there is a layer of extremely pure, and hence structurally sound, limestone at depths ranging from surface to 900 feet. The layer is anything up to 200 feet thick, and is riddled with lead and zinc mine workings and drainage tunnels. Added to these ready-dug tunnels, there is a very low population density around the mining sites, and yet remarkably good transport links. The Rhydymwyn area had wartime links to the LMS railway and the old A541, water from the river Alyn and cheap electricity. A system was devised to ensure a constant supply of fresh water to the site.

The Valley Works in Rhydymwyn, north of Mold in Clwyd, has a chequered history. The site was originally used for mining, but due to market changes was rapidly considered commercially unviable. At this point, the government gained control of the site.

In 1937, the UK War Ministry looked at the potential use of chemical weapons, and in 1938 the Valley Works (known to staff as the Foundry) was selected as the UK site for production and storage. This was followed in 1939 by the storage of over 10,000 tons of TNT in interconnected workings at Hendre. In September 1938 the Ministry of Supply started construction of a purpose-built chemical weapons storage facility. Incoming services were adequate, however waste disposal was difficult, and a 24 inch waste pipe was laid in total secrecy the six miles to the Dee estuary for the disposal of high level waste. Arrangements for gaseous emissions were classified as an "acceptable risk to the local populous".



Entrance to Tunnel 2

The early work

During October 1939 HDUM (the owners of the Hendre Mine and the Milwr Drainage tunnel, used for the TNT store) sent one shift of miners to Valley and began cutting four 30 feet wide, 8 feet high and 760 feet long tunnels into the hillside behind the surface buildings. Connected to these are a set of four storage chambers at a depth of 140 feet below surface. The work was completed in October 1940.

The four tunnels were fitted with blast doors, and two led to a set of air shafts that emerged at Twmpath. The storage capacity during 1941 was in excess of 3120 tons in forty-eight 65-ton steel and lead tanks in two of the chambers, plus 2000+ tons of charged munitions in the others. The complex used four 2-ton underground cranes to handle the munitions. In addition to this, an overflow store at a nearby location, codename 'Woodside', has capacity for 2090 tons.

The tunnelling process involved 2200 miners and 'company security' officers. The miners were told that they were preparing a set of storage tunnels for 'national art treasures'. In reality, they were not completely deceived as these were indeed stored in Clwyd, but at the Grange site, some miles to the north.

The original batch of chemicals arrived on 19th June 1940 from the ICI production facility and stored on the surface at a location codenamed 'Antelope'. They arrived by road and rail, the road convoys were made up of a tractor/trailer unit, a decontamination vehicle, and a police escort. All transports into and out of Valley had joint army and police escorts and a decontamination unit, not identified by the usual livery. The stockpile at Antelope was buried with a foot of soil and remained there until September 1941 while the handling systems were installed at Valley and Woodside. At that time, Woodside's storage tanks were installed, and the twenty 55-ton lead-lined tanks held runcol (the blistering agent used in mustard gas), 21.5 feet under the surface.

This offered minimal protection, and considering the Mold area had over 1000 air raid warnings in 1940 - 45, it is remarkable that no damage was ever inflicted to either complex. Valley (and more specifically Woodside) is the only UK wartime installation that was never located by German intelligence. Neither officially exists, even today. During the war, passing any intelligence on Valley to any member of the public, of either nationality, was a capital offence.

In January 1942, staff from ICI Randle arrived to supervise the start-up of the Valley production plant. There were numerous 'teething troubles', including several blow-outs from ventilation systems that exposed local residents to dangerous levels of constituent chemicals. The management of the site was instructed to ensure by all means that nobody tried to sue the site in case intelligence of the reported symptoms crossed to the enemy. Workers used CBS protection and barrier creams, and emergency washdown systems were built around the plant. During 1941 - 1945 there were 930 accidents, 20 percent of which were rated as 'VS/F', either 'very severe' or 'fatal'. The number of fatalities caused by Valley to the staff and residents is not officially recorded.

Munitions arrived from the start of 1941 and by the end of March the payroll lists 262 workers. Production peaked in November 1942 when over 40,000 25-lb shells were being filled every week. From April 1942 until 1945 Valley received 5,000,000 units and filled 4,720,000, plus 1,420,000 smoke-generating devices.

In 1942, after a series of incidents with leaky 65-lb devices, a dramatic drop in the worker's health (including some fatalities) forced the ICI supervisors to restrict toxic workers to a 48-hour week. 'Toxic handling' staff peaked at 406 (79 of them female) on 1st November 1942. By 1945 there were only 30 left. The total staff varied during the war from 929 at the end of March 1942, to 1756 in September, and falling to 1217 by March 1944. 160 of these were surface-based lab staff, and 120 of these were based on non-chemical work - declassified very recently as the UK atomic weapons research programme.

Chemical handling was, by modern standards, extremely poor. Waste removal was the most dangerous listed task at the site. Small items were incinerated, or boiled in soda ash. The residue was pumped along the 24-inch pipe to the Dee. The level of contamination in the estuary during the war years was categorised as 'serious'. Anything impossible to boil or burn was packed in bleach and stored in disposal pits. When these filled with water, workers had to hand-pump the pits to stop dangerous build-ups of fumes, in scenes reminiscent of Chernobyl.

By the end of January 1945 the plant had made 15,477 tons of runcol, and stored several thousand gallons of acid for mustard gas production. All chemical weapons production ceased on 29th April 1945. From 1942 to 1944 the work to separate and process uranium-235 was based at the plant.

Shift in activity

After 1945, the plant was put over to researching 'synthetic rubber'. In reality, six Metropolitan-Vickers staff, 20 atomic chemists from ICI Billingham and 20 academics led by Professors Peierls and Simons were researching membranes for isotope separation. Despite the 'removal' of all chemical weapons from the site, full chemical safety was still imposed, and all workers carried respirators. The results of the Valley membrane studies were used in the Manhattan

Project, and the contribution was critical to its success. The membrane research never developed into a full-scale atomic weapons group as the US took over the impetus in September 1943. Valley was classified as under 'care and maintenance, secure site' after 1945, and the stockpile disposed of by various means including scuttled ships in the mid-Atlantic in 1947.

In 1947, as the communist threat developed, Valley was again classified as the UK primary chemical store. The blast protection was upgraded because of the nuclear strike threat, and the surface site was redesigned. Security was seemingly low-key, and the official use of the plant remained as 'rubber research'. Guards at the site were rehoused to ensure the public could not identify the uniforms. Concrete blast covers were built over the storage chambers. In 1952 the plans show 78 chemical storage tanks.

In 1952, the official policy of the UK shifted to nuclear deterrence, and the chemical stockpile was again disposed of, either at ICI Randle as part of 'Operation Sandcastle'. The clearing process continued sporadically until in the late 1960s when the manifests show the site was clear.

Another shift

A cable link was laid from Heysham across the Irish Sea to the communications centre near Colwyn Bay (still active 1997) and via Valley to the Army HQ at Shrewsbury. The cable laying was conducted by the Ministry of Works with security provided by the MoD. All sites where the cable is accessible are protected by various methods. In 1968, civil defence was again downsized and Valley was classified 'care and maintenance: most secure site'. In 1972, the MoD established regional HQs for all areas of the UK, however there was no such facility in North Wales in order to ensure no attention was attracted to Valley. In 1981 the DoE privatised all government services to Serco, with the sole exceptions of Parliament, Hawthorn and Valley. These three came under the control of the Property Services Agency (PSA). This controlled a number of other sites across the UK, all listed as 'supply depots'. Valley was uniquely listed in the plans manifest as "Special Site : Hawthorn National Complex".

A programme on the industry of the Alyn valley by HTV in 1982 became a threat to Valley. They reported that areas of the land around the Rhydymwyn village were empty of industry and farming. The DTI quickly published a response that the sites were "prone to flooding", which is indeed true of several areas in the valley, but HTV pried further. This resulted in a response from the PSA (the first public response from the agency) stating that there were stockpiles of food and 'office equipment' stored on the site by the then Ministry of Agriculture, as a wartime reserve known as a 'buffer depot'. The PSA also stated that the site was being cleared. The visible portions of the original chemical plant air shafts were re-engineered in 1990.

Valley is now controlled by the PSA (now called Property Holdings) and MAFF.

Site visit report by Andrew Smith

March 22nd 2001 saw 5 members of Subterranea Britannica (Nick Catford, Dan McKenzie, Keith Ward, Richard Challis and myself) visit the Valley Works. This visit was arranged with and fully sanctioned by the MAFF who own the site and we were met by 2 MAFF members of staff who would escort us around the site with the local civilian security guards.

Having duly changed and collected hard hats and luminous safety jackets we started our tour of the site. Starting from the gatehouse at the northern end of the site we walked down the main road passing a number of buildings on both sides of us including P4 (Pyro production building) on our right. All these buildings were empty and had all the windows and doors removed. It became obvious that the site is very overgrown in parts and is not in use and hasn't been for several years.

We passed a number of mounds and our guides explained how these were buildings that had been demolished and grassed over. There were a couple of shaft accesses from the site to the Halkin Level (part of the Milwr tunnel complex) but these have now been capped.

We continued along the road which turned right then left at which point we came level with the northern access tunnel into the underground complex. This tunnel now functions as the emergency escape from the underground area. The blast doors have been removed and the entrance bricked up. A single steel security door with heavy-duty locks now provides access into this tunnel. Continuing along we reached the middle tunnel that is opposite the gap between P5 and P6 (Pyro production buildings) buildings. This is now the main entrance into the underground complex and has 2 heavy-duty steel security doors on it with the former blast door area being bricked up. Further along the road on our right is the entrance to the southern tunnel and this entrance is now sealed but has ventilation grills fitted high up to assist airflow in the underground section.

At this point the group split in 2, as we were restricted to a maximum of 4 people at a time underground due to health and safety requirements. Richard, Keith and the 2 MAFF officials went into the tunnels whilst Nick, Dan and myself headed to the southern end of the site to view the former filling buildings and the old railway platform. With the others going into the tunnels we continued along the road through the site heading south. The River Alyn runs through a culvert along the length of the site with a branch of it running underneath the tunnels (more on this later). As we passed P6 and entered the southern part of the site the road surface changed from concrete to Colas. This was to reduce



Tunnel 2

the risk of a spark from something being dropped onto the floor igniting one of the weapons being filled. The filling rooms are small brick and concrete structures with roof and wall vents and many have blast walls to protect the entrances. These buildings still have their WW2 camouflage paint clearly visible on them particularly on the east side which is protected from the weather. We continued along the main path down to the southern boundary fence, which is topped with barbed wire. Here the Alyn flows over what's left of the weir following the floods last year and on to the Dee estuary.

We turned and headed north walking along the east path through the site. From this path we could see much more of the paint on the side of the filling rooms and we entered all the buildings. One of these had a sign reading 'cleanway to canteen' painted on the wall in excellent condition. Many of these buildings are in a very poor state with leaking roofs etc. Set in the middle of the filling rooms was the railway platform. Again this was covered in Colas and we could clearly see where the 2 railway sidings used to be.

Continuing North we walked along the edge of the site and turned west back towards the main pathway when we reached the old sewage works. These still had a lot of machinery in place but were very dilapidated. Walking along the side of the sewage works our guides explained how in the bad flooding last year the site became awash as the Alyn overflowed and a substantial amount of flotsam and rubbish was washed onto the site. There were numerous piles of this everywhere awaiting clearance. We crossed the end of

the sewage works and headed back towards the east fence and picked up the east path again. Continuing North we passed the rear of P6 and at the gap between P5 and 6 crossed the site back to the main tunnel entrance where the first party were just emerging from the underground workings.

Richard and Keith then headed to the south of the site whilst we received a short but comprehensive safety briefing and collected our emergency respirators. Large signs outside the entrance told us that the tunnels were dangerous and empty. Our guide then led us into the tunnels. The main entrance tunnels is around 250 metres long and is concrete lined for the first half after which it is bare rock painted white. There is up to 3 inches of water on the floor of this entrance tunnel. This tunnel leads directly into chamber A that is transverse to the entrance tunnel. At this point it is possible to go left, right or straight on into chambers B,C and D.

We decide to turn right (north) and are standing at the midpoint in this chamber. The chambers are all identical and have rough rock walls painted white. Along the centre of this tunnel set into the floor are a series of drain cover grills, which are all badly rusted, and we were warned not to step on these as they would collapse under our bodyweight. There were various puddles of water on the floor in this chamber. We could clearly hear the sound of water running and this got louder the further north we headed. Reaching the northern most point of chamber A we could look down the tunnel to the northern door which was our emergency escape route. This tunnel was empty. Attached to the walls high above our heads were the fixing points for the runners for the long gone overhead cranes. There is no evidence of railway tracks in any of the tunnels.

We turned left and headed down a short piece of tunnel into chamber B. Here we could see where the water noise was coming from. There is a hole high in the roof at the northern most point of chamber B; a torrent of water was crashing down onto the floor below. This was causing the puddles that were to be found in various areas of the underground workings.

We turned south and headed down chamber B being careful not to tread in the grills set into the floor. We turned right and moved into chamber C which had sluice channels cut into the floor along each edge approximately 3 feet wide and 6 feet deep. The water tanks that stored the Runcol filled shells were located in chambers C & D and the sluice channels were to remove water that leaked from the tanks into the drainage system that was below the tunnels (more on that later). These sluices were now filled with standing water and again the floor of these chambers was wet in places.

Moving into chamber D we moved to the northern end where we viewed the way through to the air shafts. In order to access the shafts it was necessary to cross a 6ft deep water pit. This used to be the way down into the drainage system

beneath the underground chambers. The whole system was run by pumps that got rid of the excess water and the drains were up to 5ft tall in places. The pumps were switched off many years ago and these have now become flooded and access to them is not possible unless you have a wetsuit and breathing apparatus!

We continued south along chamber D and at the far end was the southern vent shaft access, which was identical to the northern one. We crossed back into chamber C and then worked our way back to chamber B and eventually A. In some of the chambers the consulting mine engineers employed by the MAFF have placed measurements to check for shifting of materials in the chambers and this has resulted in loose rock being removed in a couple of places and a small amount of re-enforcing being put in at the southern vent shaft access. We walked back to the main entrance tunnel and exited stopping to look at two vehicle gates that were rusted to the walls. These obviously provided an 'air lock' type gate for allowing vehicles in and out of the workings.

We emerged into the sunshine to be greeted by the 2nd party making their way back towards us having toured the south of the site. We then all set off together to tour the rest of the site. We walked back across the site to the east path and continued along stopping to look in all buildings of interest. Building P5 used to house flour as part of the MAFF buffer stock and directly behind P5 is one of the sheds that used to house the shunter engines. There is a small amount of standard gauge track set into the floor outside P5 on its west side.

Continuing along we then visited the quality control labs where there were a number of yellow squares in the floor marked 'toxic drain'. In these buildings which again had no windows or doors there were remains of light fittings and a number of power junction boxes on the walls. We left the labs and walked across the north end of the site passing the old powerhouse and garages that house an ambulance and fire engine arriving back at the gatehouse.

Throughout the site there are numerous boreholes that the MAFF use for monitoring whether there is any leakage from the significant number of toxic waste burial pits which are marked and fenced off on the site. The site is a mile long and is totally disused the only presence being security guards from Citex who are contracted to the MAFF to provide site security. No restrictions whatsoever were placed on us by the MAFF and we extensively photographed and made a video film of the site and the underground workings.

A book called 'The X site' detailing the history of the Valley Works was published in 2000. It is written by Tim Jones and is available from the publishers Gwasg Helygainn Ltd, 68-70 Kinmel Street, Rhyl, LL18 1AW at £10.95 ISBN 0 9522755 54

Visit to RAF Uxbridge

by Nick Catford

There have been many requests for a visit to the Battle of Britain Ops. Room at RAF Uxbridge so this was arranged for Tuesday 31st July. At the appointed time, 21 members of Subterranea Britannica (Nick Catford, Rob Templeman, Dave Farrant, Dan McKenzie, Jason Blackliston, Martin Sylvester, Caroline Ford, Graham Old, Robin Cherry, Mark Bennett, Richard Challis, Tony Page, Neal Harley, Pete Walker, Bob Clary, Rod Taylor, Duncan Halford, Terry White, Richard Lamont, Ian Walker, Keith Ward) presented themselves at the guardhouse of this still active base and we made our way in convoy to the bunker on the far side of the site.

Although the Ops. Room is now a private museum you can't just turn up at the gate expecting a visit. Being an operational base, visits have to be arranged well in advance and there is a long waiting list. The Ops. Room was closed in 1958 and locked up until the mid 1970's when it was restored to its current state. (Very little restoration was required).

Before the war, RAF Fighter Command, responsible for the aerial defence of the UK, divided the country into geographic areas named Fighter Groups. No 10 Group covered southwest England with its HQ at Box in Wiltshire. No 11 Group covered London and southeast England and was based at Uxbridge in West London. No 12 Group covered the midlands and was centred on Watnall in Nottinghamshire whilst No 13 Group which then covered the remainder of the country to the north lived at Kenton Bar in Newcastle.

HQ Fighter Command was located at Bentley Priory in Stanmore, which apart from the administration HQ contained the Air Defence of Great Britain (ADGB) filter and operations rooms, The former to filter incoming information from radar stations, observer corps posts etc to remove duplication, doubt and confusion in order to present the latest and clearest information on the plotting tables at both command and group. The latter to allocate threats to the various groups for defensive measures to be taken and to maintain a complete oversight of the battle.

11 (Fighter) Group HQ was based at Hillingdon House within the grounds of the RAF Depot, Uxbridge, but independent of it. The underground operations room (subject of this article) was built also within the grounds nearby. This Group was subdivided into 7 Sectors:- A or Tangmere Sector Station, satellite at Westhampnett. B or Kenley Sector Station, satellite

at Croydon. C or Biggin Hill Sector Station, satellites at West Malling and Lympe. D or Hornchurch Sector Station, satellites at Hawkinge, Manston, Gravesend and Rochford. E or North Weald Sector Station, satellites at Martlesham Heath and Stapleford Tawney. F or Debden Sector Station, no satellite and lastly Z or Northolt Sector Station, no satellite.

Sectors G - Y were in other Group areas and other airfields belonging to other Commands ie Coastal Command, Army Co-operation Command, RNAS etc were within 11 Groups area but not under its command.

The other main resource for ADGB within 11 Groups area were the 16 Group administered Chain Home (CH) radar stations at Bawdsey, Bromley, Canewdon, Dunkirk (Kent), High St Darsham, Pevensea, Poling, Rye, Swingate (Dover) and Ventnor with Chain Home Low (CHL) stations at Beachy Head, Dunwich, Fairlight, North Foreland, Truleigh Hill and Walton (upon Naze).



The emergency exit



The operations room

Before entering the bunker, we were able to see then standby set house where the original 1930's standby generator and associated control equipment is still in place and fully operational as was demonstrated when the generator was started for us. The building is typical of its type, a brick blockhouse with a brick blast wall around it; it was one of three on the base.

From the standby set house we walked the 50 yards to the bunker, an unobtrusive flight of steps down into the ground beside some bushes beside the road. Apart from two small ventilator stacks alongside nothing else is visible here. The whole area is grassed over. On the far side of the grassed area is a small wood where the emergency exit is located with a rectangular brick pillbox overlooking it. The emergency exit is slightly more substantial with its heavy blast door and two more ventilator stacks behind.

The two level bunker is 60 feet below ground accessed by two flights of stairs. Between the two flights is one of two identical ventilation plant rooms (one used only as a back up), these again date back to the late 1930's when the bunker was built and are fully operational and in use to this day. At the bottom of the second flight of stairs we found ourselves in a rectangular ring corridor with most of the rooms accessed from the inner part of the ring. Half way along one of the long sides we entered the Ops. Room at the lower floor. The room is really on two and a half levels. Above is the control room with curved glass panels to cut out reflection and noise, but at the back of the room steep wooden steps lead up to a low balcony overlooking the plotting table.

The room has been restored to the state it was in during the Battle of Britain with the large irregularly shaped, angled plotting table taking up much of the floor. This shows a map of south east England showing the group and sector boundaries and the various airfields. Here small flagged blocks could be pushed into place to show the positions of the various squadrons. At the rear of the room are the tote boards, one for each sector airfield

showing the state of all aircraft within the group by means of various coloured lights. Overlooking the Ops Room to one side is a small observation area that was put in for a visit by King George VI.

We were able to enter most of the rooms around the corridor including areas not normally accessible to the public. These included the second plant room and emergency exit, ejector room for the sewage and GPO room where the original 1930's frame was still in place. All the original cables are still in place in cable runs along the wall and at the back of the Ops. Room there was a Lamson Tube message handling system. Along the two long corridors are stairs to the upper level with three control rooms, one manned by members of the Royal Observer Corps, these look down into the Ops. Room through curved and tinted glass windows, all original. These rooms now house the museum with a large number of exhibits in glass cases. We were shown a film made by the RAF about the Battle of Britain and the bunker. We spent nearly two and a half hours in the bunker and were free to wander round at our leisure both below ground and in the vicinity of the bunker on the surface. There were no restrictions on photography.

Paddock

By Nick Catford

Following the Munich crisis in 1938 the government revived an earlier scheme to move central government out of the capital in the event of war with the construction of four underground citadels in northwest London, one each for the three Services and a fourth, which became the bombproof Emergency War Headquarters at Dollis Hill in the grounds of the Post Office Research Station that had opened there in 1921. Work on the underground citadel to be known as 'Paddock' began in secrecy.

It consisted of a single storey surface building with a strengthened basement and sub-basement. The Government would occupy 19 rooms of the basement and the 18 rooms of the sub-basement with 22 rooms above ground. Other rooms would also be made available in the main Post Office building. The citadel was capable of withstanding a 500 lb bomb.

Paddock finally took on its roll on Thursday 3 October 1940 when a meeting of the full War Cabinet began at 11.30 a.m., attended by Churchill, twelve other Ministers and the three Chiefs of Staff.

This was to be Churchill's only visit to Paddock although a second War Cabinet met there on 10th March 1941 under the chairmanship of Clement Atlee. It was seen as an opportunity to impress The Australian premier Robert Menzies who had come to London on a three-week visit, during which he regularly attended Cabinet meetings. Menzies gave the cabinet a detailed account of the Australian war effort.

There was no sleeping accommodation at Paddock; the government had taken over Neville's Court, a block of flats in Dollis Hill Lane knocking two flats (18 and 27) into one for Churchill.

Churchill made it clear that he didn't like Paddock describing it in his memoirs as 'far from the light of day'. On the 22nd October 1940 he commented, "The accommodation at Paddock is quite unsuited to the conditions which have arisen. The War Cabinet cannot work and live there for weeks on end, while leaving the greater part of their staffs less well provided for than they are now in Whitehall. Paddock should be treated as a last-resort Citadel."

When Germany invaded Russia the threat of Whitehall being devastated by enemy bombing receded and Churchill gave up his flat in Neville's Court although 5 rooms at Paddock remained available for his staff, seven for other War Cabinet Ministers, three for War Office chiefs, seven for Home Forces Advanced GHQ and ten for part of the War Cabinet secretariat and Joint Intelligence Committee together with the map room, the Joint Planners' room and a room for the Dominions liaison officers.

This situation remained unchanged until the summer of 1943 when the 'V' weapons caused Churchill to review the London citadels. Churchill preferred the bottom floor of the newly constructed North Rotunda close to Whitehall and Paddock's furnishings were removed to this new citadel known as Anson. Paddock was redundant by December 1943 and abandoned a year later.



The standby generator

Post war use is unclear although it was considered as the North Group Control for the London Region but this was rejected by the GLC. In later years it was, in parts, it was used for recreation with the Post Office Social Club located there while other rooms were used for storage, it was however largely derelict.

Following the closure of the Post Office Research Station the site was sold to a property developer who converted the main research station block into luxury flats and cleared the rest of the site ready for new housing. The citadel however, having local authority listing, was untouched and two access points were retained one an unobtrusive steel door in a wall between two houses and the other, new brick cladding around an original entrance building beside the road; this also houses a small electricity sub station. The site has now been handed over to a housing association. Until recently, the only access was through the door between two houses (which involves walking across someone's front garden) as the key to the other entrance had been lost.

Behind the door is a narrow spiral staircase that descends thirty feet to the upper level of the two level bunker. Signs on the wall indicate this is Floor 27 (the lower level being Floor 28), which seems strange, as there were certainly never 26 floors above it just a single storey above ground. At the bottom of the stairway is some ventilation plant with the air intake trunking and electrical switchgear. The spiral staircase enters one end of a 150' long spine corridor. Immediately to the left is the ventilation and filtration plant room with everything still intact. Beyond this is a second spiral stairway down to the bottom level. There are rooms left and right along the corridor, most are empty apart from the occasional filing cabinet and table but there is a long room on the far end on the left that still retains a GPO switching rack at one end. At the opposite end a long rectangular hole has been cut in the wall into an adjoining room; this gives the impression of being a bar so it is assumed this was the social club. Behind these two rooms is a long

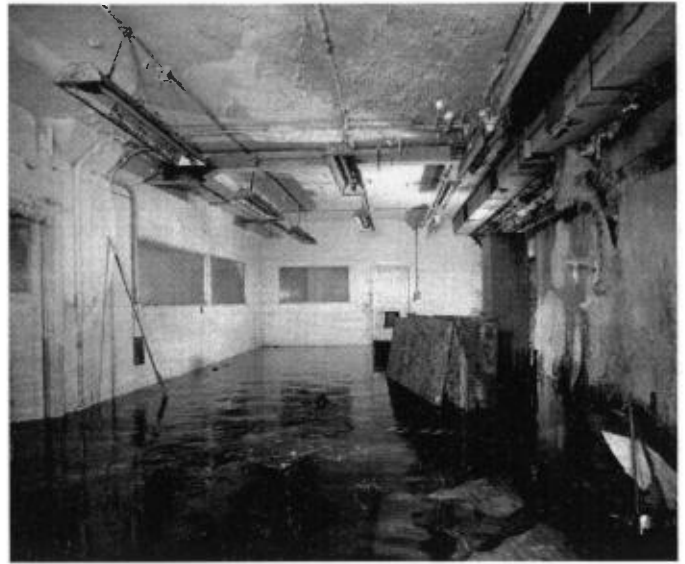
narrow room with a tiled floor, which must have housed the emergency batteries.

On the right hand side of the corridor in the centre is a wide stone stairway up to the main entrance and down to the lower level. On one side of the stairway is a room with the walls covered in wire mesh, which would have given a similar effect to a Faraday Cage although with no ENP during the war it is unclear what this room might have been used for. On the other side of the stairway is a small kitchen with sink, preparation area and a small serving hatch into the corridor. At the far end of the spine corridor signs point to 'Emergency Exit' which presumably would have been another spiral staircase up to the surface. This has been bricked off at the bottom; there is however another spiral staircase down to Floor 28.

The lower level is flooded to a depth of one foot and in one area a short side corridor and the rooms surrounding it are covered, in sheets of dry rot which is very picturesque appearing a little like cotton wool. There is some evidence of recent new wiring on this level and there are several new pumps lying in the water. This work seems to have been abandoned and the wiring now is probably useless. On this level all the rooms are on the west side of another long spine corridor. One appears to be a 'Map Room', the heart of the bunker with windows into four adjacent rooms. At the southern end is the main plant room with a standby generator; more ventilation plant and numerous 1940's control boxes and switchgear.

It is interesting to note that there are no toilets underground, these were located only in the surface building.

As part of the sale agreement, the housing association are



The Map Room

obliged to open the bunker to the public on two days per year. This hasn't happened yet following a disagreement with the contractors who should have carried out repairs. It is due to be pumped dry in September 2001 and basic lighting will be installed in the two corridors, stairs and some of the rooms. Assuming a health and safety certificate is received it is planned to open the bunker in Spring 2002.

The owners have allowed several visits by members of Subterranea Britannica during the summer of 2001 and 50 people have seen the bunker, many of them wading through the deep water.

If anyone else would like to come along on the open days please telephone me to reserve a place (01322 408081)

Oxgate or I.P.

By Nick Catford

With the need to move central government out of Whitehall in the event of a devastating attack, the Admiralty chose a site close to the Edgware Road between Humber Road and Oxgate Lane, about 500 yards south of Staples Corner. The Admiralty's naval charts establishment had occupied the site since 1923 and a vacant plot of land fronting on to Edgware Road seemed an ideal solution.

The plan was for a three storey building above ground with an upper basement and a special lower basement, which later influenced the design of the citadel at Dollis Hill. Work on the bunker started in late 1937 and in December 1939 the Admiralty were able to occupy the Oxgate Citadel with a small party of naval (one naval captain and seven naval commanders) and civilian staff ensuring that in the event of an attack rendering Whitehall unusable there would be a secure alternative command centre. The surface building now numbered 403 - 405 Edgware Road was completed a year later.

Because this was a sort of insurance policy, the staff who went to Oxgate were known within the Admiralty as the 'insurance party' and the Citadel acquired the code-name I.P.

The Oxgate Citadel was used continuously into 1943 but was redundant by the end of 1944. Post war it was occupied

for many years by the Health and Safety Executive as a laboratory. It is now in private hands and sections of it are leased to a number of different companies selling carpets.

The upper basement level is used as a carpet warehouse and there is little evidence of its former use. The original lift to the building above is still in place with its associated control cabinet, although now out of use. There are several gas tight doors one giving access to a narrow spiral staircase down to the lower basement and to another gas door acting as an emergency exit.

The main way down to the bottom level is wider stone stairway with shelves above it stacked with wooden crates containing unused filters. These have the makers name Sutcliffe & Speakman and are dated 1939. At the bottom of the stairs is a thick steel and concrete blast door. Unfortunately this bottom level is flooded to within one foot of the roof so further exploration was not possible.

The home of Sir Arthur 'Bomber' Harris

By Andrew Smith

Who would have thought that a leafy Buckinghamshire lane would contain a house with so much of interest to Sub Brit? Nestled in the rolling Chiltern Hills lies an impressive property which earlier this year came on the sale market with a price tag of £1.75M. So what is so special about this house – well it is the former home of Sir Arthur 'Bomber' Harris and the official residence of every Air Chief Marshall of the RAF up until 1997.

There had been some discussion about this property on the RSG closed mailing list and as the property is located just a few miles from me I decided to see if I could go and have a look at what I expected to be a magnificent property. I was not disappointed!!

A few phone calls later and I had found someone with the keys and the codes to the multiple alarm systems and duly got in the car to meet them and visit one of the most interesting and little visited houses in the home counties.

The house itself is set back from the road behind electronic gates and has just over 5 acres of grounds including a tennis court, stables and staff accommodation. The current owners purchased the house from the RAF in 1998 and by the time you read this the house will have new owners.

The house is fully functional having been used until quite recently, power, water and gas are all connected and the house and grounds are protected by several alarm systems which operate independently and as an overall coherent system. Should the occupant just wish to alarm the perimeter of the house this is possible allowing someone inside the house to move around without setting off an alarm. All alarms were monitored by the RAF Police at Strike Command. They are now monitored by a civilian company that also patrols the property a few times a day.

The house was originally constructed in the 1800's and has been altered over the years. It is not the most attractive of properties to look at but it is unique in terms of what happened there. The only listed feature is a 200 year old willow tree in the extensive grounds, which also include a paddock and tool store.

The house is approached along a tarmac drive, which splits to provide parking both in front and behind the property which is shielded from the road by trees. There are a number of garages at the rear of the property and this is also where the tool store and stables are located. Whilst in the tool store I discovered the old staff work diary that listed all the staff that had worked at the property from 1990 onwards. Cooks, cleaners, gardeners, valets – all had been recorded in this most interesting volume which will be passed to the new owner upon sale.

The ground floor of the house consists of 2 substantial reception rooms, both of which had been used for formal entertaining. It emerged that both Eisenhower and de Gaulle had both visited the property whilst Bomber Harris was in residence. The kitchens were extensive and still had an original Aga range. The Butlers rooms were also on this floor and the drawers and cupboards were all labeled (in true military style) with what was contained within including 'Dress Napkins, everyday napkins, Royal Doulton, Crystal, Banquet cutlery and everyday cutlery.' All the drawers and cupboards were lined in felt to protect the contents. Just along from this room is the security office where there was a

security officer 24/7 whilst the property was occupied by the RAF. This is where all the telephone lines enter the building.

Just off the main entrance hall was one of the 5 bathrooms and a door that led down into the cellar. It was thought that Bomber Harris used this part of the house as an air raid shelter during WWII. Today it contains 2 very substantial safes one of which is open. Just off this area is a wine store, unfortunately it was empty. The entire house is wired for a Butler call system, which still works today.

Stairs in the hallway lead up to a galleried landing and this is where things started getting very interesting. Turning right at the top of the stairs we arrive at a re-inforced security door, which leads into the dressing area. In view of the risk of terrorist attack, at somepoint in the 70's or 80's an inner sanctum was created on the first floor of the house which created a strong room comprising the master dressing suite and bathroom where the occupants could shelter should they come under attack. The dressing area itself has a bullet resistant window, which is sealed. The door leading into this area can only be opened from the inside once the additional locks are deployed and there are a number of panic buttons in this area. From the dressing area a door leads into the bathroom which also has a protected window. Again panic buttons and alarm panels are present and a second heavy duty security door leads into the master bedroom. It was obvious that should one of the inner sanctum rooms be breached that the occupants could lock the connecting door from either side to provide a 'last ditch' secure area.

Both of the secure doors have fast action closing mechanisms, which slam the door shut with a mighty thwack! The inner sanctum protection was only on the windows and doors and only against ammunition so an RPG attack or similar would probably breach the secure area.

The master bedroom itself overlooks the rear garden and is huge. This is the bedroom that Bomber Harris used according to my well informed guide. On this floor are further bedrooms and bathrooms and the ACM's study. This is the only other room to have a bullet proof window and is located at the front of the property.

This is a unique property in terms of both its history and physical features. It does need some work on the flooring, electrics and décor but we can only hope that the new owner chooses to do this sympathetically and not to destroy what is without doubt an important piece of our military history.

I was very fortunate to visit the property and this was achieved by calling in a couple of favors and knowing the right person to talk to. It will not be possible to organise a general visit (I did ask) and unauthorised visitors will be met by monitored alarm systems and a civilian security company. I would like to thank my host who I cannot identify for obvious reasons.

BOOK REVIEWS

Trevor D. Ford. Old Millclose mine, Wensley, Derbyshire. Bulletin Peak District Mines Historical Society. 14(3): v + 79pp + inserted folded plan. 2000. Available from Peak District Mines Historical Society Ltd, Peak District Mining Museum, The pavilion. Matlock Bath, Derbyshire DE4 3NR. www.peakmines.co.uk

This special edition contains the following papers

P.J. DEAKIN & D.J. WARRINER: Colour photographic supplement (pages ii - v)

D.J. WARRINER: Old Mill Close mine and sough: exploration report (pages 1 - 52)

K.D. RUSS & J.D. LYRE: Processing survey data from Old Mill Close mine (pages 53 -56)

D.WARRINER: Survey of Yatestooop sough (pages 57 - 62)

Trevor D. FORD: The geological setting of Old Mill Close mine, Wensley, Derbyshire (pages 63 - 67)

J.H. RIEUWERTS; The history of Old Mill Close mine, Wensley (pages 68 - 79)

Paul W. Sowan

Peter STANIER. Stone quarry landscapes: the archaeology of quarrying in England. Tempus Publishing Ltd. 2000 160pp paperback. £16.99 +p/p. Tempus Publishing Ltd., The Mill, Brimscombe Port, Stroud, Gloucestershire GL5 2QG ISBN 0-7524-1751-7

Peter Stanier is an established and well-regarded industrial archaeologist, with an impressive list of published papers and books to his credit. This present volume will not disappoint readers, at least if the author's self-imposed and clearly proclaimed terms of reference are taken on board.

The author has set out to introduce an under-appreciated branch of industrial history and archaeology, of quarries broadly defined, to the general public; and has chosen to do this, largely, with reference to important sites to which public access is relatively easy, and at which significant archaeological evidence is readily visible. To this reviewer's mind, he succeeds impressively, whilst also providing leads to important but more obscure aspects of his subject, subterranean quarrying not least amongst them.

The earlier chapters in the book deal with more or less general principles. The point is validly made that quarries (and indeed their products in the built landscape) are as important archaeological features as field systems, trackways, and settlement sites, all of which have enjoyed far more attention from archaeologists in the past. What is to be understood by the term 'quarry' emerges little by little, rather than being clearly defined at the outset. Although much of the text is concerned with quarrying *sensu stricto*, or in the, let us say, pre-1800 understanding of the word as relating to the extraction (whether opencast or underground) of dimension stone for building. There are numerous references to the working of chalk pits for lime-burning, roadstone quarries, pits for the extraction of raw materials for cement manufacture, and even to pre-historic flint mines. Some account of the changing meaning, in common usage, of the term 'quarry' might have been helpful ... during the 19th century the word gradually came to be understood in terms of specifically open pits for all sorts of minerals (a meaning ultimately incorporated in law by the *Quarries Act*, 1894), although many subterranean works for building-stone, despite being legally 'metalliferous mines' under the *Metalliferous Mines Regulation Act*, 1872, were still commonly referred to as quarries into the 20th century. This is important for persons wishing to pursue their own researches into documented quarry history, and Peter Stanier's generous 'further reading' list leads one to suppose one of his aims is indeed to stimulate further research, as the sources he cites include many considerably less readily accessible than his sample sites. To some extent, the specifically archaeological evidence cited is scattered throughout the book, and that which is presented tends to relate more to dimension-stone working than to, say, chalk pits for lime-burning. More could have been said about the value of quarry spoil as evidence - the size

grades and nature of rejected material can be more readily informative than the rare included pottery fragments or other finds sieved out of many cubic metres of generally archaeologically sterile (in finds terms) debris. From time to time there are sweeping statements, sometimes including the 'weasel words' 'must have', without archaeological evidence.

A comprehensive work on quarrying, even in the narrower sense of building-stones, would require a far larger volume than this, and to find fault with a brave and most welcome effort would be less than generous. However, a difference between the cover title and the (bibliographically supreme) title page is unfortunate. There are, inevitably, minor errors. Kentish Rag (page 18) is a limestone, not a sandstone. The technical geological term 'outcrop' is misused as a synonym for exposure. There are tautologies such as 'new innovation.' The further reading list might well have included Robert Hunt's (1860) pioneer nationwide listing of pits and quarries (*sensu lato*) as in 1858 (*Memoir of the Geological Survey: Mining Records. Mineral Statistics ... Part II for 1858*) which, despite its many faults, is a foundation stone for 19th century quarry history research.

The exemplar sites or topics described in some detail are the Wiltshire sarsens, the Peak District millstone industry, Cornish moorstone, the Barnack 'hills and holes' of Cambridgeshire, Bath stone, Ham Hill stone (Somerset), Purbeck quarries (Dorset), Portland quarries (Dorset), chalk pits and limeworks, Dartmoor granite (Devon), Cornish slate (Delabole and other quarries), Honister slate quarries (Cumbria), Threlkeld quarries (Cumbria), the Clee Hill roadstone quarries (Shropshire), and the National Stone Centre (limestone openworks at Wirksworth, Derbyshire.) Arguably, therefore, the scene painted is incomplete in that clay pits, sand and gravel pits (and some minor extractive industries) are barely considered. However, the author has done well to compress a very readable overview and introduction into a small compass, and indeed to drop numerous hints to the curious to follow-up, including the importance of underground workings (this is made clear in text and illustrations) in, at least, the Bath, Purbeck, and Lake District areas.

The excellent illustrations include numerous black-and-white and colour photographs, line drawings and maps, and show landscapes, extraction sites, quarry plant, and important archaeological details. Entrances to underground workings, and underground views, are included. The guide to further reading, if readers choose to pursue the matter, will doubtless keep the public libraries' splendid inter-library loans service busy for some years, and good bibliographical data for items are supplied (so often missing from such lists.) Entries in the 'further reading' section (six pages) are helpfully grouped under chapter headings. There is a three-page index.

Paul W. Sowan

Various v.1 Various v.1 Cumbria Amenity Trust Mining History Society: The Mine Explorer 4: [iv] + 119pp This fourth volume is a well-produced compilation of papers, including black-and-white photographs, line drawings, maps, etc, as follows

Ron Calvin: Cumberland Mines Rescue Service, 1914 - 1986 (pages 1 - 7)

Ian Matheson: Working practices at Coniston in 1858 (pages 8 - 9)

John Helme: Newland iron furnace [verston] (pages 10 - 16)

Peter Holmes: Aerial ropeways (pages 17 - 20)

Jon Knowles: Moses Kellow (1862 - 1943) (pages 70 - 72)

D.J. Blundell: Greenside mining accidents (pages 73 - 75)

D.J. Blundell: Greenburn or Great Coniston copper mine, Little Langdale: a collected history (pages 76 - 80)

Ron Calvin: Birkshead gypsum mine, Long Marton, Appleby-in-Westmorland (pages 81 - 83) E.

Alastair CAMERON (edr.) Lakeland's mining heritage: the last 500 years. Cumbria Amenity Trust Mining History Society. 2000: [iii] + 215pp hbk. ISBN: 0-9539477-0-X hbk. £ 15.99 + 3.39 p/p Sheila BARKER, Cumbria Amenity Trust Mining History Society, The Rise, ALSTON Cumbria CA9 2DB

This volume surveys the history and extant relics of the mining industry in parts of the former counties of Cumberland, Lancashire, and Westmorland, and is written by members of the Cumbria Amenity Trust Mining History Society.

Mineral products are treated separately, iron ore mining by Richard Hewer and Alen McFadzean, slate quarrying (largely underground) by Alastair Cameron, coal mining by Ronnie Calvin, copper mining by Peter Fleming, barytes mining by Alen McFadzean and Ian Tyler, wad (graphite) mining by Dave Bridge, lead and zinc mining by Ian Matheson and Chris Jones, and wolfram (tungsten) mining by David Blundell.

The emphasis is on underground mining in the upland areas, so there are no sections for (for example) gypsum mines, building-stones quarries, or the extraction of aggregates, all of which are or have been of economic importance in Cumbria.

The book is well produced, and profusely illustrated with numerous black-and-white and colour photographs (many of underground subjects) and some line drawings and location maps.

There is a three-page glossary of mining terms, a three-page bibliography, and a five-page index. **Paul W. Sowan, 15/03/2001**

Alastair CAMERON Slate from Honister: a history and description of the slate industry at Honister: Cumbria Amenity Trust Mining History Society, 1998: 91pp pbk. £7.95 + £ 1.00p/p

Available from Sheila BARKER, Cumbria Amenity Trust Mining History Society, The Rise, ALSTON Cumbria CA9 2DB

This work describes the geographical and geological setting of underground slate quarries at Honister Crag (in former Cumberland, now Cumbria) in the Lake District) and the working of those quarries and their associated transport systems. There are two main sections, the first devoted to the history of the quarries, the second forming a field guide to access roads, external inclines, underground workings in the Honister and Kimberley bands, surface and underground workings at Yew Crag, and associated railway installations. The recorded history extends from c. 1700 to the present day, as some small-scale slate quarrying has been resumed in recent years.

There are detailed maps and sections, and black and white photographs of slate quarrying operations and installations (including some underground views.) There is a two-page index. Apart from a few works cited under 'acknowledgements' there is no listing of published or unpublished sources, or guide to further reading.

Paul W. Sowan 15/03/2001

Isobel GEDDES. Hidden depths: Wiltshire's geology & landscapes: Bradford-on-Avon: Ex Libris Press: 222 + (2) adverts pp. 2000 ISBN: 1-903341-05-1 pbk. £ 9.95 (p/p extra). Available from Ex Libris Press, 1 The Shambles, BRADFORD ON AVON Wiltshire BA1S 1JS. www.ex-librisbooks.co.uk

The nine chapters in this book introduce geological principles, explain the stratigraphical column, consider Wiltshire's geological resources and extractive industries, and describe the geology of the six landscape areas into which the county is divided. Illustrations include a geological map, stratigraphical column, geological sections, line drawings, and numerous black-and-white photographs including extractive industrial sites, geological exposures, buildings and building-materials, and landscapes.

The resources chapter deals with building stones including Bath stone from Box, Corsham, etc, Chilmark stone, Swindon stone; sarsen stones, and others; chalk, clay, and cement manufacture; sands and gravels;

iron ores; soils; and water supply.

There is an eight-page glossary of geological terms, a one-page bibliography, and an eight-page index.

Paul W. Sowan, 15/03/2001

Simon DENISON Lead mining tradition of central Wales goes back 4,000 years to the Bronze Age: earliest evidence of lead mining at Cwmystwyth : British Archaeology 58 (April 2001), page 4. Available from: Council for British Archaeology, Bowes Morrell House, 111 Walmgate, YORK, YO1 9WA

(01904-671417 admin@britarch.ac.uk

Reports excavation of a Bronze Age copper and lead mining site at Copa Hill, Cwmystwyth, mid-Wales, including finds of mining equipment. Radio-carbon dating suggests that the site was mined sporadically for copper for up to 600 years, commencing about 2000 BC. Lead veins appears to have been worked in the latter part of the timespan. It is suggested that drainage difficulties led to the mines being abandoned. Waterlogged deposits have preserved wooden and other mining equipment including steps, launders, ropes, and baskets. Antler and stone tools are also reported. **Paul W. Sowan 19/04/2001**

Cris EBBS Underground Clwyd: the armchair explorers' guide. A pictorial expedition into the nether regions of northeast Wales Chester: Gordon Emery: 72pp. 2000. Oblong paperback. £ 9.95 inc. p/p ISBN: 1-872265-93-6 inc. p/p from Mike Moore, 35 Masons Place, NEWPORT, Shropshire TF10 7JS

This is an album of black-and-white photographs, mostly taken underground, with extended and informative captions and additional supporting text. The subjects depicted include mines and subterranean quarries for limestone and sandstone, silica, and calcite (seven pages); slate mines (five pages); coal mines (seven pages); lead mines (24 pages); bone caves (four pages); and 'sporting caves' (16 pages.)

The scenes shewn include re-use (a since failed military museum at Grange caverns), mine entrances and buildings, view in worked-out stopes, underground transport systems, shafts, drainage tunnels, etc.

There is a guide to further reading (seven recently published titles), and a single-page index to sites illustrated.

Paul W. Sowan 26/03/2001

Simon WALKER. Underground Hitchin: a look at what's under our feet. Hitchin Historical Society: (1) + (i) + 93pp. 2000. £8.95. ISBN: 0-9512109-4-7

This work describes and discusses the history of underground spaces and structures in and around Hitchin, Hertfordshire. There are chapters devoted to tunnels; river culverts; icehouses; cellars, sewers, drains and waterworks; wells and pumps; air-raid shelters; and miscellanea.

Illustrations include maps, line drawings, and black-and-white photographs. There is a page-and-a-half bibliography, and a four page index. **Paul W. Sowan, 26/03/2001**

Peter DOYLE, Franky BOSTYN, Peter BARTON and Johan VANDEWALLE. The underground war 1914 - 18: the geology of the Beecham dugout, Passchendale, Belgium. Proceedings Geologists Association 112(3), 263 - 274. 2001. From Geologists' Association, c/o Geological Society of London, Burlington House, Piccadilly, LONDON W1V 9AG www.geologist.demon.co.uk

This paper reports the archaeological and geological investigation of a crown hole collapse beside a farmhouse near the top of the Passchendale Ridge. This revealed a WWI dugout to accommodate four officers and 66 men. The T-shaped tunnel system is excavated in silty sand, and geological and hydrological details are given. The paper is illustrated with plans and sections to show the setting, geology, and dugout details and internal arrangements, and two photographs.

Paul W. Sowan 10/08/2001

Quarterly Journal of Engineering Geology and Hydrogeology 34(3) August 2000. From Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, BATH BA1 3JN <http://bookshop.geolsoc.org.uk>

This issue contains:

J.N. HUTCHINSON, D.L. MILLAR, and N.H. TREWIN, Coast erosion at a nuclear waste shaft, Dounreay, Scotland (pages 245 - 268)

The nuclear establishment on the cliffs of Caithness was established in the 1950s, and in 1956 a shaft was sunk to a depth of 65 m through Caithness Flags in connection with the driving of a wastewater drainage tunnel out to sea (about 47 m below OD.) An inclined inland access tunnel to connect with this was also driven, and the bottom of the 4.5 m diameter shaft sealed off. From 1957 onwards the shaft was used for the disposal of radioactive waste. In 1977 a (chemical) explosion blew off the concrete lid of the shaft, and scattered radioactive waste over the nearby area.

This paper is a geological and geomorphological study of the 10-12 m high cliff, the top of which is about 12.5 m from the shaft, and foreshore, with a view to estimating the likely time it would take for marine erosion to reach the shaft. It is concluded that, in the absence of a major tsunami, erosion will reach the shaft in from 160 to 240 years, and the shaft will be flooded in about 400 years. There is currently a proposal to remove radioactive waste from the shaft in the next 20 years.

D. CROOT and J.S. GRIFFITHS, Engineering geological significance of relict periglacial activity in south and east Devon (pages 269 - 281)

Four study areas are reported - South Hams, west Dartmoor, Torbay, and Axminster.

M.S. RILEY, R.S. WARD and R.B. GRESWELL, Converging flow tracer tests in fissured limestone (pages 283 - 297).

Considers the Lincolnshire Limestone aquifer, about 12 km S of Lincoln. S. DUMPLETON, N. S. ROBINS, J.A. WALKER, and P.D. MERRIN. Mine water rebound in south Nottinghamshire: risk evaluation using 3-D visualization and predictive modelling (pages 307 - 319)

Considers the effects of progressive abandonment of the South Nottinghamshire coalfield on the security of the Permo-Triassic Sherwood Sandstone aquifer, with particular reference to acid mine water. A map covering the Sheffield - Chesterfield - Nottingham area shows eight still operational collieries, selected closed collieries, and operational and non-operational pumping stations.

Paul W. Sowan, 07/08/2001

Preservation of Derbyshire lead mines and Scheduled Monument status / The designation of metal mines in the Peak District as Scheduled Ancient Monuments. NI. Peak District Mines Historical Society 97, 5 - 6 + 4pp supplement. 2001. From PDMHS Ltd, Peak District Mining Museum, The Pavilion, South Parade, MATLOCK BATH, Derbyshire DE4 3NR

Jim Rieuwerts' article describes the application of English Heritage's Monuments Protection Programme to lead mines in the Peak District, and John Barnatt's supplement provides additional detail and an updated list of lead mines in that area now having Scheduled Ancient Monument status.

Thirty-five SAMS are listed, with SAM number, name, location (NGR), area in hectares, and notes on the types of mining features included within the scheduled areas - considerably more detail than has heretofore appeared in EH's own 'County Lists!' The PDMHS list is restricted to sites clearly associated with shafts (engine houses and the like), rakes (lines of surface workings which may include leads underground), and soughs, so does not include other features such as smelt mills. The EH 1994 list for Derbyshire had only 11 mine / rake / sough features as SAMS, so the number of lead scheduled lead mine

remains in Derbyshire has been approximately trebled.

The point is made that the MPP and the scheduling have been undertaken almost exclusively with reference to standing and still visible surface structures, not to underground spaces. And that anything within and below the scheduled area is legally protected (including shafts or parts of shafts, stopes, soughs, etc), but that mined voids beyond the boundary lines have no legal protection.

Paul W. Sowan 08/02/2001

Paul BERGNER. Befehl "Filigran": die Bunker der DDR-fuehrung für den Ernstfall. 2nd edn. 176pp. 2000. Available locally in Germany

Includes details, plans, sections, and black-and-white and coloured photographs of secret underground Cold War bunkers in former East Germany and two coloured maps.

Paul W. Sowan, 26/08/2001

I. LETO and B. WELBURN. Lines 2 and 3 of the Athens Metro. Civil Engineering [Proc. Institution Civil Engineers] 132(2/3), 68-76. 1999

From Thomas Telford Ltd., Thomas Telford House, 1 Heron Quay, LONDON E14 4JD. www.ice.org.uk or <http://www.t-telford.co.uk>

Describes the creation of new Metro lines in Athens (Greece) including extensive tunnelled sections in hard rock; the project includes 14 km of hard rock tunnels, 29 shafts, and 21 underground stations. The work has entailed the archaeological examination of 30,000 square metres of land, in excavations up to seven metres deep in soils above rockhead. Additionally, tunnelling at greater depths in hard rock has revealed (at a depth of 15 m) Hadrian's aqueduct, a tunnel which supplied the city with water from Pendeli, as well as numerous wells of archaeological interest.

Paul W. Sowan 10/01/2001

Trevor D. FORD. An unusual bit of the hard stuff - Derbyshire chert. *Geology Today* 16(4), 143-148 2000. From: Blackwell Science Ltd., Osney Mead, OXFORD OX2 0EL (T) +44(0) 1865 - 206206

Deals with chert mining in the neighbourhood of Bakewell, Derbyshire. The geology of chert formation is described, the beds are described, and the mines and mining methods explained. The illustrations include a location map showing 10 or so underground and surface workings, associated workshops, etc. There is also a survey of the Holme Bank and Holme Hall chert mines. The uses of the chert, in making grindstones for pottery manufacturers, are also described.

Paul W SOWAN 28/10/2000

Harry PEARMAN Caves and tunnels in south east England. Part fourteen. Records Chelsea Speleological Society 26: ii + 4pp Published: 2001 £ 5.50 from Harry Pearman, 58 Prospect Place, Wapping Wall, LONDON E1W 3TJ 020-7265-05 14 www.chelseaspelaeo.org.uk

Contents include the following

High Elms ice well, Bromley
The Stafford Hotel, undercrofts, London
Betchworth limeworks, underground chamber, Surrey
Shoreham Harbour, conduit, Sussex
Clerkenwell, House of Detention, London
West Hoathly, caves / rock shelters, Sussex
Beachy Head, natural caves, Sussex
Brede waterworks, control bunker, Sussex
Fullers earth mines, Bedfordshire

Hearthstone mines {&c}, Godstone, Surrey
Beeding quarry, caves, Sussex
Reading, chalk mines, Berkshire
Brook Street (Erith), subsidence, London
Wilmington, denehole, Kent
Hartlip, chalkwell, Kent
St Mary's Platt, sand mine, Kent

Bushey Hall Golf Course, icehouse, Herts
 Bellmans Town, well, Sussex
 Croydon, shaft
 Crystal palace, voids below terraces
 Kingsway, tram tunnel, London
 Clarendon arch and tunnel, New River
 Cranford House, cellars, Hayes
 Heathrow Airport, railway tunnel
 Heydon Hall, tunnel, Norfolk
 Martin Mill, adit, Kent
 Buckland Hospital, tunnel, Kent
 Norwich, subsidence
 Highgate, disused railway tunnels, London
 Hungerford, chalk mines, Berkshire
 Cave, Hastings, Sussex
 Frindsbury, tunnel, Kent
 Worthing, wells / adits / cave, Sussex
 Beddington, well, London
 Margaretting, Essex
 Chiddingstone, tunnel, Kent
 Orpington, chalk well
 Belvedere, denehole, London
 Dover, tunnels, Kent
 Chesmunds, caves, Kent
 Tonbridge, cellar, Kent
 Way Farm, shaft, Kent
 Broadstairs, pit, Kent
 Sutton in Hone, subsidence, Kent
 Hemel Hempstead, well
 Dover Harbour, tunnels, Kent
 Leigh-on-Sea, tunnels, Essex
 Upper Berkeley St., tunnel, London
 Stanmore Common, icehouse, Herts
 Falmer, well, Sussex
 Pulborough, well, Sussex
 Camden Roundhouse, undercroft
 Physic well, London
 Sundridge Park, icehouse, Kent
 Bankside power station, tunnels
 Brighton, tunnel, Sussex
 Henry VUI's wine cellar, London
 Dodsdon brickworks, shaft, Wilts
 Erith, subsidence, London
 Nonington, ice well, Kent
 Eastry, well, Kent
 Richmond, adits, Surrey
 Chatham, tunnels, Kent
 Chalk mines, east Kent
 Henley on Thames, chalk adits
 Punceford, limestone workings, Sussex
 Harting, wells, Sussex

Paul W. Sowan, 01/02/2001

Stewart BENNETT and Nicholas BENNETT (eds). An historical atlas of Lincolnshire. University of Hull Press: (iii) + 159pp + 2 folded maps. 1993. £14.95 ISBN 0-859558-604-9

Contents include the following

Tom Lane - Salt making I: Iron Age and Roman, 26 - 27
 Hilary Healey - Salt making II: Saxon and Medieval, 28 - 29
 Jane Young - The distribution of Silver Street kiln -type pottery in Lincolnshire, 30 - 31
 Simon Pawley - Domesday watermills in Lincolnshire. 44 - 45
 David Robinson - Drainage and reclamation, 72 - 73
 Neil Wright - Turnpike and stage coaches, 78 - 79
 Neil Wright - Navigable waterways and canals, 80 - 81

Neil Wright - Railways and docks, 112 - 113

Neil Wright - Ironstone mining, 114 - 115

David Robinson - Brick and tile making, 116 - 117

Neil Wright - Malting and brewing, 118 - 119

Each 'theme' is a two-page spread with a map and facing text. Stone quarrying is not noticed! There are pages of supplementary notes, references, etc.

Paul W. Sowan, 31/01/2001

JR RIEUWERTS Lathkill Dale, Derbyshire: its mines and miners. Landmark Publishing Ltd: 110 + (2)pp. 2000 £ 16.95 + p/p ISBN 1-901522-80-6. From Landmark Publishing Ltd, Waterloo House, 12 Compton, ASHBOURNE, Derbyshire DE6 1DA. www.landmarkpublishing.co.uk

This is a thorough account of metalliferous mines, almost exclusively for lead ores, in a Derbyshire valley in the Peak District. The author, a chartered geologist and founder member of the Peak District Mines Historical Society Ltd, sums up some 40 years researches in this area.

The geographical and geological context of Lathkill Dale are explained, with several maps. The history of mining in this area from 1284 onwards is described. A guide is presented to features currently visible. Details for soughs and pumping engines and shafts are included.

There is a chronological table (pages 91 - 95), a glossary of mining terms (pages 96 - 103), a bibliography (page 104), a list of references (pages 105 - 108), and an index (page 110.)

The work is well illustrated, with sketch maps, and black-and-white and coloured photographic illustrations, above and below ground.

Paul W. Sowan, 03/03/20

Cumbria Amenity Trust Mining History Society: The Mine Explorer 4. 1994 [iv] + 119pp. £3.00 + £1.00 p/p [ISSN 0266-5700] From Sheila BARKER, Cumbria Amenity Trust Mining History Society, The Rise. ALSTON. Cumbria, CA9 2DB

This fourth volume is a well-produced compilation of papers, including black-and-white photographs, line drawings, maps, etc, as follows
 Ron Calvin: Cumberland Mines Rescue Service, 1914 - 1986 (pages 1 - 7)

Ian Matheson: Working practices at Coniston in 1858 (pages 8 - 9)

John Helme: Newland iron furnace [verston] (pages 10 - 16)

Peter Holmes: Aerial ropeways (pages 17 - 20)

D.J. Blundell: Cove dam disaster at Greenside mine. October 1927 (pages 21 - 24)

D.J. Blundell: Greenside mine in liquidation. May 1935 (pages 32 - 42)

W.G Collingwood: Leavings of German miners (pages 28 - 31)

Dave Bridge: The German miners and the question of bismuth (pages 32 - 42)

Dave Bridge: The German miners and the question of wad. (pages 43 - 46)

Jon Knowles: Moses Kellow (1862 - 1943) (pages 70 - 72 [Welsh slate mining])

D.J. Blundell: Greenside mining accidents (pages 73 - 75)

D.J. Blundell: Greenburn or Great Coniston copper mine, Little Langdale: a collected history (pages

Anton D.Chenylle-Proctor-Thomas: Pump it up (pages 84 - 107) Logan Beck copper mine, with underground photographs, plans and sections of workings, etc]

Dave Bridge and Ian Matheson: The Elizabethan lead mine at Greenhead Gill, Grasmere (pages 108 - 119) **Paul W. Sowan 15/03/2001**

Mike WINNEY (edr). Channel Tunnel Rail Link. New Civil Engineer (Supplement), 28 June 2001: 36 pages

£ 10.00 order via (T) 020-7505-66 14

This supplement, issued with *New Civil Engineer*, reviews progress with Sections 1 and 2 of the Channel Tunnel Rail Link from Folkestone to London (St. Pancras.)

Details are given of works in progress, in prospect, or completed, in the Kings Cross / St. Pancras area (London), at Stratford, Ebbsfleet, and Ashford; and in connection with tunnels as follows

London - Gifford Street portals - Stratford (new station) - two 7.15m diameter tunnels (7.5 km) (Intermediate shafts at Corsica Street and Graham Road)

Stratford (new station) - Ripple Lane portals - two 7.15m diameter tunnels (9.93 km) (Intermediate shafts at Woodgrange Road, Barrington Road, and Wayside)

Thames (Thurrock to Swanscombe) - two 8.1m diameter tunnels (2.5 km)

Pepper Hill - short tunnel under A2

North Downs - double track tunnel (3.2 km)

Boxley, Eyhome St. (360m), Harrietsham and Sandway tunnels - short tunnels beside M20 for environmental protection)

Ashford - cut and cover tunnel west of new station

Mersham tunnel

Paul W. Sowan 18/07/2001

Diarmaid FLEMING. Living on air: changing groundwater conditions have triggered a spate of foundation problems

New Civil Engineer, 10 May 2001, 22-24. From New Civil Engineer, 151 Rosebery Avenue, LONDON EC1R 4GB

Describes subsidence problems affecting houses and flats built over chalk mines at Reading (Berkshire) and Norwich (Norfolk), and over limestone mines at Ferniehill (Edinburgh.)

Paul W. Sowan 18/07/2001

Industrial Heritage 27(2) Summer 2001. From Hudson History of Settle, Procter House, Kirkgate, SETTLE, North Yorkshire LS24 9DZ www.users.daelnet.co.uk/hudson-history/

This issue of Industrial Heritage contains

Tom Greeves, The Dartmoor tin industry., some aspects of its field remains, pages 2 - 10

Phil Hudson, A coalmine at Clintfield in Tatham ancashire], pages 14 - 21

G Barclay Robertson, 'Strome Ferry? No ferry', pages 22 - 24

Ivor J. Brown, A new life for Oddball and her friends, pages 25 - 27

John Hustler, Canal navigations, pages 28 - 32

Anon. What is a coal tax post?, page 33

John Keavey, Pakenham water mill [Suffolk], pages 34 - 36

Rota [John Keavey], Leeds leads ... early transport proposals for Roundhay park, pages 37 - 40 [Trams]

Paul W. Sowan 29/07/2001

G.F. STONEHOUSE. The ice-house at Abinger Hall. Proc. Leatherhead & District Local History Soc. 6(4), 94 - 96..2000 From Leatherhead & District Local History Society, Hampton Cottage, 64 Church Street, LEATHERHEAD, Surrey KT22 8DP

Describes a National Trust owned ice-house, which has been cleared out, measured and recorded. The structure, formerly belonging to the Abinger Hall estate, was first mentioned in sale particulars of 1803, and shown on the 05 25-inch map of 1873. The article includes an outline sketch drawing, and a photograph of the entrance. Leading dimensions are given. A full report, with measured drawings and photographs, has been lodged with the National Trust, Surrey Archaeological Society, and Surrey Local History Centre.

The survey group has been unable to locate the ice-house at Polesden Lacey, and is currently surveying one at Juniper Hall, Mickleham.

Paul W. Sowan 21/2/2001

Jamie CARSTAIRS A room with no view. Geographical Magazine 73(3)(March 2001)

13 photographs of 'pit houses' in the Matmata area in southern Tunisia, and interiors and inhabitants. The rooms of the houses are excavated in tufa in the four sides of rectangular pits. There are extended captions with the photographs.

Paul W. Sowan 23/2/2001

L.V. Rutgers. Subterranean Rome: in search of the roots of Christianity in the Catacombs of the Eternal City. Leuven: Uitgeverij Peeters: 164pp. 2000. ISBN: 90-429-0857 £ 14.50 from Oxbow Books, Park End Place, OXFORD, OX1 1HN 01 865-241249

This is a guide to the more important of the approximately 60 catacombs in Rome. The colour and black-and-white illustrations include catacomb plans, underground views and art, cisterns and tombs. Sections are devoted to the Vatican Necropolis (a pagan necropolis under St Peter's), and to the Jewish catacombs.

Practical details for visitors are given, both for access to catacombs regularly open to the public and to arrangements needed to be made for access to nonpublic / tourist sites.

There is a glossary of terms (two pages), a selected bibliography (two pages), and a two-page index.

Paul W. Sowan, 04/10/2001.

Mike OSBORNE. 20th century defences in Britain: Cambridgeshire, including Peterborough and Huntingdon. Concrete Publications: 104pp. 2001 ISBN: 0-9540378-0-4. From £ 8.50 incl. p/p from Concrete Publications, 45 Church Street, MARKET DEEPING, Lincolnshire PE6 8AN

This is the third in a series of volumes of which two have already appeared (from a different publisher) dealing with Kent and Lincolnshire. The author (who also wrote the Lincolnshire volume) has been actively involved with the Defence of Britain project, and these published volumes are aimed at the interested general public and deal largely with still-visible and sometimes visitable structures, written 'for those wishing to explore the area.

The main chapter headings are Airfields, Air defence, Defence against invasion, and Industry and agriculture.

The work is well illustrated, with photographs featuring, *inter alia*, the Cambridge RSG hangars, control towers, water towers, a munitions shelter, the L-shaped blast walls at a Thor ICBM site, an ROC post, pillboxes and gun sites, POW camps, etc. Maps and plans include Anti-invasion defences in Cambridgeshire, two detailed maps for Cambridge, Pillbox plans, the Peterborough defence plans (including one for the power station) with railway details, Armoured train patrol routes 1940-43, and a general map of the County.

There is a one-page bibliography, and a five-page gazetteer of sites listed by national grid references, with brief descriptions, under the headings Airfields, Airfield buildings, Anti-aircraft sites, Anti-tank obstacles, Battle headquarters,

Bombing decoys, Control towers, Hangars, Headquarters, Home Guard stores / shelters, Pillboxes and gun emplacements, Royal Observer Corps posts [three underground] and spigot mortar pedestals. One page headed Places to visit advises that most sites and structures described and listed can be seen from public roads and footpaths.

Paul W. Sowan 2/10/2001

News from the West of England

The Bath Chronicle 6/8/01 tells us that planning has been granted for Hansen Aggregates to extend the underground stone workings at Westwood Mines.

Meanwhile at Limpley Stoke villagers are concerned about plans to extend stone mining at Hayes Wood Mine. Bath Chronicle 9/6/01

Also at Limpley Stoke the Bath Chronicle recently recorded that a local history group were taken on a tour of Stoke Hill stone mine which belongs to the Bath Stone Company.

This underground quarry provides a slightly courser stone than was used in the building of Bath but was used in the refurbishment of Windsor Castle after the late 20th century fire. During the war the underground quarry was used to store ammunition.

Bath Chronicle 15/5/01 describes the rescue of Matthew Head from Stainsbury Shaft at Chaterhouse in the Mendip Hills. This story reached the national press because the unfortunate Mr. Head, a keen walker, was trapped for 11 days. Incredibly he survived but it took 3 hours to release him.

His cries for help were heard by a group of children on a supervised night walk who were actually listening for nocturnal sounds. Reported missing he might have been found earlier but foot-and-mouth restrictions had limited walking in the area.

It must be said that other reports claim he climbed over a 4ft high security fence and abseiled down the 200ft shaft before becoming trapped

Bath is acquiring a new under-the-road tunnel. A scheme is under way to build cheap housing for the elderly at Combe Park. A new drain is to be installed under the main road in a tunnel rather than dig up the road as is usually the case. Bath Chronicle 1/6/01

The Fuller's Earth works site at Combe Hay near Bath is the subject of a development plan. Developers Gazelle Properties intend to build offices and shops but retain existing buildings. Bath Chronicle 22/6/01 describe the site which was abandoned in 1980 as a disused mine site. The new proposals can be seen on www.gcparch.co.uk/follydown.

A local paper in February also says work has begun at Spring Quarry to house a media centre, a data centre, studio, film stages and backlot facilities

The very long story of the stabilization of the stone mine workings at Combe Down continues. Bath and North east Somerset Council News, September 2001, reports that the geophysicists have completed there work. Their problem of the firm Parsons Brinkerhoff, was examine the strength of the rock, find underground spaces which might have been previously missed and provide details of waterflows in the earth. At first they expected to drill, much to the dismay of the long suffering residents of the area above the caves, 300 bore holes but this was reduced to 30 by using what a local paper 31/5/201 calls hi-tech scans. That was the good news for the residents but the bad news (Bath Chronicle 2/8/2001) was that a cavern just five feet below the road service of the residential estate was discovered. Thus further restrictions on the weight of vehicles entering the estate were enforced. To add to there discomfort it was reported, but not explained (Local News 5/5/2001), that the mine entrances were attracting giant rats.

The mine entrances are at Byfield and Firs Mines and have been specially strengthened to allow experts access to the mines and safe routes have been created through the mines but only for those studying the mines. All this is preliminary to the actual stabilization of the mines but before this happens the method to be used has to be worked out with public consultation.

The project officer was appealing for scraps of information residents might have about the caves and a staircase which connected the cellar of the pub King William IV to Byfield mine was discovered in March 2001. Prof. Dick Irving a member of the Combe Down Heritage Group believes that part of the miners' wages may have been paid in drink tokens and that the mine manager was also involved in the pub.

Detailed information about he project is available from the Combe Down Stone mines Information Centre, at 2A Avenue Place, Combe Down, Bath or Trimbridge House, Trim Street, Bath. www.stone.mines.co.uk

Subterranea Britannica FRANCE TRIP 2002

We are planning another weekend over (and under!) the channel, visiting some more subterranean French sites. This will be the fourth year of our excursions to Northern France; here are the dates and *provisional* details, so you can get it in your diaries!

Dates: Saturday and Sunday 11th & 12th May 2002

Possible sites (we won't have time to visit them all!)

Gravelines - citadel and town fortifications

Muches (another one like Bouzincourt last year)

Cambrai stone quarries

Channel Tunnel construction - video presentation

Tunnels under Albert, town on the Somme

Calais Museum of 2nd World War (in an old German bunker)

Coal Mining museum

Location: Overnight in Arras or similar

Transport: Coach, via Le Shuttle

Times: Pickup at Ashford railway station 0800/Saturday; return 1900/Sunday

Includes: Dinner & Hotel on Saturday night; breakfast and lunch on Sunday

Coach and Le Shuttle fare Briefing pack, maps and notes, entrance fees

Cost: approx. £90 per person

All the above is subject to confirmation, after exploration during the early part of this year.
Final details in March/April 2002.

If you'd like to register your interest and/or reserve a place,
please can you complete the slip below & send to:

Linda Bartlett/Martin Dixon (SB France),

Heathend Cottage, Windsor Road, Ascot, Berkshire, SL5 7LQ.

If any queries in the meantime, contact us on 01344 875424,
email martin.m.dixon@british-airways.com

Linda Bartlett and Martin Dixon

THE FOURTH ANNUAL SUB - BRIT COLD WAR STUDY DAY
HACK GREEN SECRET NUCLEAR BUNKER NANTWICH CHESHIRE
SATURDAY 13th APRIL 2002

You are invited to join fellow members at Hack Green Nuclear Bunker for the fourth annual cold-war study day. For those of you who have been to any of the previous study days you will know what to expect - a fascinating and full day, and this year will again be no exception.

Our main speaker is that font of all knowledge regarding Cold-War architecture and bunkers, Mr Wayne Cocroft. (English Heritage). For those of you who were unable to go on the recent Sub-Brit tour of Eastern Europe Cold War bunkers, Wayne will reveal some of what was hidden behind the Iron Curtain. The sheer volume and complexity of the bunkers & sites is awesome, a presentation not to be missed.

There are also some films and other related talks on the day.

More time this year will be made for you to bring along your discoveries to share with fellow members, as last year we ran out of time. Let me know in advance if you have any A/V requirements.

There will also be more time this year to explore the 35000 sq ft headquarters, there have been a number of new acquisitions for 2002 - Cold War items I know you have never seen before.

The massive Marconi radar array will be operational all day.

The cost of only £18 per person includes
 entry to the museum all day,
 your private use of the mezzanine level,
 all presentations and the usual sumptuous buffet lunch.

All you need to bring is yourself.

Fill in the booking slip and enclose a cheque for £18 per person payable to "The Secret Bunker Co".

I will mail you confirmation.

NOTE: the previous study days have all been oversubscribed
 (last year it was over 70 members)
 so book **EARLY** to secure your place

----- Cut Here -----

HACK GREEN COLD WAR STUDY DAY- SATURDAY APRIL13th 2002

Name.....

Address.....

Phone

Fax

E-Mail

Names of other persons in your group 1.....

2..... 3.....

4..... 5.....

Return with a cheque for £18 per person payable to: "The Secret Bunker Company"

To Mr Rodney Siebert, Hack Green Secret Bunker, P.O. Box 127, Nantwich, Cheshire, CW58AQ.

Phone: 01270 - 623353/Fax: 01270 - 629218 E-Mail: coldwar@hackgreen.co.uk

SUBTERRANEA BRITANNICA

A SORROWFUL ANNOUNCEMENT

The Bunker at Mistley in Essex is to close as a Museum at the end of October 2002.

The Mistley Anti Aircraft Operations Room (AAOR) was built in 1951 for the Royal Artillery (War Office) and controlled the guns covering the Harwich GDA (Gun defended area). It was part of 1 Group reporting to the Sector Operations Centre at Bawburgh. The Bunker is semi-sunken with the upper floor above ground and the lower floor below ground and contains over 1300 m² of space.

The hub of the bunker was the two level operations room with a plotting table on the lower floor overlooked by the controllers on the balcony above. By the end of the 1950s the building was redundant and it was taken over by Essex County Council in 1963 as one of their emergency control centres for running the county in the event of a nuclear war. It became one of 4 HQ's that divided Essex into 4 areas and would have been controlled from Chelmsford.

However by 1966 the bunker became the main HQ for the County as the proposed Chelmsford HQ had not been built. In about 1980 it was relegated to county standby when the long awaited County Control at Chelmsford was finally opened. The bunker remained fully operational until 1993 when it was de-commissioned along with many others, at the end of the 'Cold War'. Strangely for the staff, the bunker at Mistley still offered a higher level of protection than the new Chelmsford control centre.

In 1996 Mistley bunker opened to the public as a cold war museum. Fully restored and equipped it now gives a chilling insight into the 'Secrets of the Cold War'. The museum will close to the public after 27th October 2002 and the exhibits will be dispersed amongst other cold war museums.

Mistley village is one mile east of Manningtree on the south bank of the Stour a couple of miles from the A137 Colchester to Ipswich road. The museum itself is located in Shrubland Road, Mistley and is well signposted from the B1352 Harwich Road.

There will be special evenings of closure ceremonies on 23rd, 24th, 25th and 26th October, 2002. It is suggested that Sub. Brit. might like to make block bookings for one or more of these evenings. If you like the sound of this, contact Malcolm Tadd on 017378 23456.

The Committee decided to arrange for Sub. Brit. members to get together on 23rd June 2002 for a day at Mistley, before it knew of the closure. So let Malcolm know if you are interested.

There will be more details of both of the above in the *Spring Newsletter* due May 2002, DV.

Regrettably Barbara and Malcolm Tadd will not be available for any of these dates due to existing commitments but intend to visit Mistley on some other occasion.

MCB (with many thanks to Malcolm Tadd and Nick Catford for the information on this page).

SUBTERRANEA BRITANNICA

AN IMPORTANT ANNOUNCEMENT

A message from Malcolm Tadd

I have been finding speakers and producing a programme for the Sub. Brit. Spring and Autumn Day Conferences for many years. But I am now old, knackered, failing in intellect, apathetic and generally becoming incapable. OK, so no change – but I am capitulating. From now on someone else will have to take over – **could this be the opportunity you have been waiting for?**

These conferences are meant to serve the whole of the Sub. Brit. membership and promote all aspects of man-made and man-used underground structures. So if you take on the job you should, ideally, have a very wide range of interests. The sort of programme¹ that would interest a broad spread of members might be:

- English Gardens Grottos
- Surveying techniques in large mining systems
- Underground sites as places of sexual encounter
- A survey of extant W.W. II air raid shelters
- Communication Tunnels under a large city.
- Wall markings in Cathedral Crypts

To be fair, it won't suit you if are an obsessive cold war enthusiast unless you are keen to expand your interests. However if you are such an RSG person, I and the committee would still like to hear from you because RSG is developing its own range of conferences.

Returning to the matter in hand. If you take on my job, you will **not** have to worry about the conference general administration; your basic concern would be to find speakers and produce a programme to an agreed deadline.

Help will be at hand. For the present, I can continue to assist with suggestions and advise as can other committee members all of whom pass on details of prospective speakers from time to time.

Malcolm Tadd

¹ To my knowledge, Sub. Brit. has not had any of these presentations at a Day Conference during the last twenty or so years; if you know somebody who could talk on one of these topics, please tell me or another Committee member.